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JUMO flowTRANS MAG H01

Electromagnetic flowmeter

for hygienic applications

Brief description

The electromagnetic flowmeter JUMO flowTRANS MAG H01 was specially developed for hygienic applications in the food and pharmaceutical industry and is available in numerous nominal widths.

The design which consists completely of stainless steel makes cleaning easier, is suitable for hygienic applications and is FDA-compliant.

The variable connection concept with standardized sensor provides flexibility and makes mounting easier.

The JUMO flowTRANS MAG H01 provides users with a versatile, inexpensive flowmeter that is synchronized precisely to your requirements, has a short delivery time, and includes a simple and easily understandable documentation.

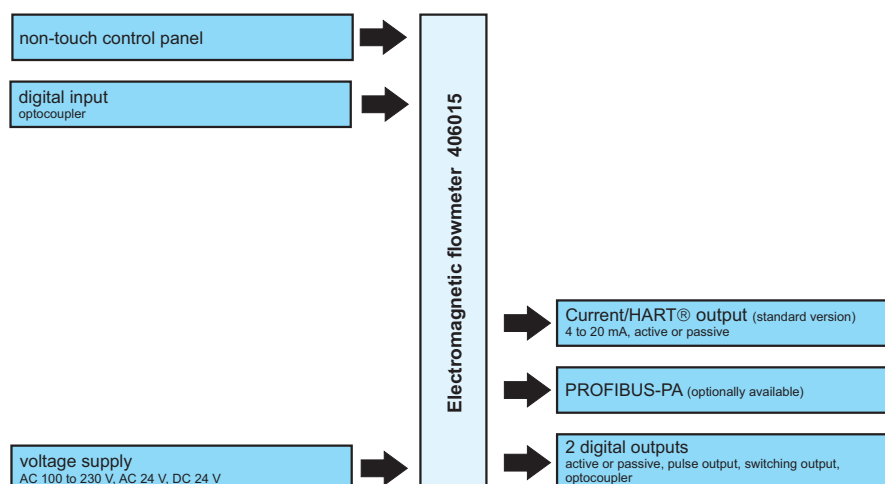


compact design



remote mount design

Block diagram



Special features

- High degree of accuracy
- Extremely simple operation
- State-of-the-art diagnosis for empty pipe detection
- Simpler and quicker fault rectification thanks to diagnosis-based help texts
- Digital communication via HART protocol (standard) or PROFIBUS-PA (option)
- Nominal pressure: PN 10, 16, 40, CL150, CL300
- Process connection: welded socket, compression fitting, Tri-Clamp, connection flange
- Lining: PFA
- Medium temperature: up to 130 °C (266 °F)

Approvals/approval marks (see "Technical data")



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Description

General information

The JUMO flowTRANS MAG H01 was developed with particular consideration for the requirements of the food and pharmaceutical industry. The modular device concept offers flexibility, cost-effective operation, and excellent reliability with a long operating life and minimal maintenance costs.

Diagnostics functions

State-of-the-art diagnostics functions such as "empty pipe detection" and "sensor measurement" monitor the functional capability of the device and the process.

The limit values for the diagnosis parameters can be adjusted on-site. If these limit values are exceeded, an alarm is issued.

The diagnosis data can be extracted via a state-of-the-art Device Type Manager (DTM) for further analysis. Critical states can therefore be detected at an early stage and countermeasures can be taken.

This enables higher productivity and avoids down times.

Status messages are classified in accordance with the NAMUR requirements.

In the event of a fault, a diagnosis-based help text is displayed which makes it significantly easier and quicker to rectify the fault. This provides maximum process reliability.

Sensor

The variable connection concept with standardized sensor provides flexibility and makes mounting easier. Spare parts stock and consequently storage costs can be reduced. The vacuum-proof, dimensionally stable PFA lining meets the highest standards. The sensor is suitable for CIP/SIP cleaning up to 150 °C (302 °F). State-of-the-art filter methods that separate the measurement signal from the interference signal enable precise measurement with outstanding accuracy (max. measurement deviation: 0.2 % of the measured value).

Startup

The latest memory technology in the sensor eliminates the need to check the assignment of the sensor and transmitter. The transmitter

detects the sensor automatically using the built-in "SensorMemory". Once the voltage supply is switched on, the transmitter carries out self-configuration. The sensor data and the measuring-point specific parameters are loaded automatically. Potential errors are thus eliminated and startup is quick and reliable.

Operation

The parameters pre-set in the plant are changed via the user-friendly display and non-contact operating buttons – quickly and easily without the need to open the housing. The easy setup function also guides inexperienced users smoothly through the configuration, step by step.

The softkey functionality makes it as easy to use as a modern cell phone. During configuration, the admissible setting range of the relevant parameter is shown on the display and inadmissible entries are rejected.

Transmitter

The back-lit display can be turned without additional tools. The contrast is adjustable and the display is fully configurable. The size of the characters, the number of lines, and the resolution of the display (decimal points) are variable. In multiplex mode, several display appearances can be flexibly preconfigured and called up in succession.

The intelligent module design of the transmitter slot enables simple dismantling without unscrewing cables or removing connectors.

Whether it is for counting pulses (active or passive), 20 mA (active or passive), status output (active or passive) – the universal transmitter always offers the right signal. The HART protocol is standard here.

Alternatively to the HART® protocol, the transmitter can be equipped with PROFIBUS-PA as an option.

Conformities

The JUMO flowTRANS MAG H01 complies with the device standard for the food and pharmaceutical industry. It meets the various NAMUR requirements.

Function overview

The following table provides an overview of the most important functions.

Measuring accuracy
0.4 % (optional 0.2 %) of the measured value
Additional software functions
Measuring units, editable counters
Graphic display
Line recorder function
Fieldbus
PROFIBUS-PA (optional)

Device version

The JUMO flowTRANS MAG H01 is available in a compact and remote mount design type.

Compact: Sensor and transmitter form one mechanical unit.

Remote mount: Sensor and transmitter are placed in separate housings.

The housings are available as single-compartment or dual-compartment housings, depending on the requirements concerning the Ex-protection type.

Overview of available versions:

	JUMO flowTRANS MAG H01	
	Compact	Remote mount
Standard	Single-compartment housing	Single-compartment housing
No Ex-protection		
Ex-protection	Single-compartment housing	Single-compartment housing
Zone 2, 21, 22		
Ex-protection	Dual-compartment housing	-
Zone 1, 21, 22		

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Technical data

Design

JUMO flowTRANS MAG H01 – compact design

406015/1-0 (without Ex-protection)	406015/1-1 (Ex-protection zone 2)	406015/1-1 (Ex-protection zone 1)
Transmitter: single-compartment housing 	Transmitter: single-compartment housing 	Transmitter: dual-compartment housing 
	ATEX/IECEX Gas zone 2 Dust zone 21, 22	ATEX/IECEX Gas zone 1 Dust zone 21, 22



IMPORTANT (NOTE)!

The scope of delivery for the compact design type includes the sensor and transmitter as one mechanical unit (model 406015/1-0 or 406015/1-1).

If only the sensor model 406015/2-0 or 406015/2-1 is needed, the order code "Remote mount design (sensor) ", page 45 should be used to generate the correct order details.

If only the transmitter model 406018/2-0 or 406018/2-1 is needed, the order code "Remote mount design (transmitter) ", page 48 should be used to generate the correct order details.

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Model number	406015/1-0, 406015/1-1	
Measured value deviation	Standard: 0.4 % of the measured value Option: 0.2 % of the measured value	
Nominal width range	DN 3 to 100 (1/10" to 4")	
Process connection	Wafer design Compression fitting according to DIN 11851 PN 10 to PN 40 Welded socket according to DIN 11850 PN 10 to PN 40 Tri-Clamp according to DIN 32676 PN 10 to PN 40 Tri-Clamp according to ASME BPE PN 10 to PN 40	
Lining	PFA (vacuum proof)	
Conductivity	> 5 µS/cm, (20 µS/cm for demineralized water)	
Electrodes	1.4539 [904L], Hastelloy C, tantalum	
Process connection material	Variable process connections: 1.4404	
Protection type	IP65, IP67 (NEMA 4X)	
Temperature of medium	Flange: -25 to +180 °C (-13 to +356 °F)	
	Variable process connections: -25 to +130 °C (-13 to 266 °F)	
Approvals		
Electromagnetic compatibility	2014/30/EU – EMC	
Ex-protection	2014/34/EU – ATEX IECEX	
Pressure equipment directive (PED)		
Conformity assessment according to Category III, Fluid group 1	2014/68/EU (Article 13) 2014/68/EU (Mod. B+D)	
Transmitter		
Voltage supply	AC 100 to 230 V (-15/+10 %), AC 24 V (-30/+10 %), DC 24 V (-30/+30 %)	
Current output	4 to 20 mA active or passive	
Pulse output	Active or passive can be set using software on-site	
Switching output	Optocoupler, programmable function	
Switching input	Optocoupler, programmable function	
Display	Graphical display, adjustable	
Housing	Compact design, available as either single-compartment or dual-compartment housing, depending on the requirements concerning the Ex-protection	
Communication	HART protocol (standard), PROFIBUS-PA (option)	
Electrical safety	According to DIN EN 61010-1	
Electromagnetic compatibility	According to DIN EN 61326-1, DIN EN 61326-2-3	


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JUMO flowTRANS MAG H01 – remote mount design

406015/2-0 (without Ex-protection) Sensor 	406015/2-1 (Ex-protection zone 2) Sensor  ATEX/IECEX Gas zone 2 Dust zone 21, 22
406018/2-0 (without Ex-protection) Transmitter: single-compartment housing 	406018/2-1 (Ex-protection zone 2) Transmitter: single-compartment housing  ATEX/IECEX Gas zone 2 Dust zone 21, 22



IMPORTANT (NOTE)!

The scope of delivery for the remote mount design type includes the sensor (model 406015/2-0 or 406015/2-1) and the corresponding transmitter (model 406018/2-0 or 406018/2-1) in separate housings.

If only the sensor model 406015/2-0 or 406015/2-1 is needed, the order code "Remote mount design (sensor) ", page 45 should be used to generate the correct order details.

If only the transmitter model 406018/2-0 or 406018/2-1 is needed, the order code "Remote mount design (transmitter) ", page 48 should be used to generate the correct order details

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Sensor	406015/2-0, 406015/2-1
Measured value deviation	Standard: 0.4 % of the measured value Option: 0.2 % of the measured value
Nominal width range	DN 3 to 100 (1/10" to 4")
Process connection	Wafer design Compression fitting according to DIN 11851 PN 10 to PN 40 Welded socket according to DIN 11850 PN 10 to PN 40 Tri-Clamp according to DIN 32676 PN 10 to PN 40 Tri-Clamp according to ASME BPE PN 10 to PN 40
Lining	PFA (vacuum proof)
Conductivity	> 5 µS/cm, (20 µS/cm for demineralized water)
Electrodes	1.4539 [904L], Hastelloy C, tantalum
Process connection material	Variable process connections: 1.4404
Protection type	IP65, IP67 (NEMA 4X), IP68
Temperature of medium	Flange: -25 to +180 °C (-13 to +356 °F) Variable process connections: -25 to +130 °C (-13 to +266 °F)
Approvals	
Electromagnetic compatibility	2014/30/EU – EMC
Ex-approvals	2014/34/EU – ATEX IECEX
Pressure equipment directive (PED) Conformity assessment according to Category III, Fluid group 1	2014/68/EU (Article 13) 2014/68/EU (Mod. B+D)
Transmitter	406018/2-0, 406018/2-1
Voltage supply	AC 100 to 230 V (-15/+10 %), AC 24 V (-30/+10 %), DC 24 V (-30/+30 %)
Current output	4 to 20 mA active or passive
Pulse output	Active or passive can be set using software on-site
Switching output	Optocoupler, programmable function
Switching input	Optocoupler, programmable function
Display	Graphical display, adjustable
Housing	Remote mount design, available as single-compartment or dual-compartment housing, depending on the requirements concerning the Ex-protection
Protection type	IP65, IP67 (NEMA 4X)
Communication	HART protocol (standard), PROFIBUS-PA (option)
Electrical safety	According to DIN EN 61010-1
Electromagnetic compatibility	According to DIN EN 61326-1, DIN EN 61326-2-3

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General information

Reference conditions according to EN 29104

Medium temperature	20 °C (68 °F) ±2 K
Ambient temperature	20 °C (68 °F) ±2 K
Voltage supply	Nominal voltage according to the nameplate $U_n \pm 1 \%$, frequency $f \pm 1 \%$
Installation conditions	Upstream > 10 × DN pipe section Downstream > 5 × DN pipe section
Warm-up phase	30 min

Maximum measurement deviation

Pulse output	
Standard calibration:	±0.4 % of measured value, ±0.02 % Q_{\max} DN (DN3 to 100)
Optional calibration:	±0.2 % of measured value, ±0.02 % Q_{\max} DN (DN10 to 100)
Q_{\max} DN ⇒ See table "Nominal width and measuring range", page 8	
Analog output effect	Same as pulse output plus ±0.1 % of measured value + 0.01 mA

Repeatability, response time

Repeatability	≤ 0.11 % of the measured value $t_{\text{meas}} = 100 \text{ s}$ $v = 0.5 \text{ to } 10 \text{ m/s}$
Response time Current output with an attenuation of 0.02 seconds	For a step function 0 to 99 % 5 $t \geq 200 \text{ ms}$ at 25 Hz excitation frequency 5 $t \geq 400 \text{ ms}$ at 12.5 Hz excitation frequency 5 $t \geq 500 \text{ ms}$ at 6.25 Hz excitation frequency

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Nominal width and measuring range

The measuring range end value can be configured between $0.02 \times Q_{\max \text{ DN}}$ and $2 \times Q_{\max \text{ DN}}$.

Nominal width		Minimum measuring range end value	$Q_{\max \text{ DN}}$	Maximum measuring range end value
DN	Inch "	$0.02 \times Q_{\max \text{ DN}} (\approx 0.2 \text{ m/s})$	0 to $\approx 10 \text{ m/s}$	$2 \times Q_{\max \text{ DN}} (\approx 20 \text{ m/s})$
3	1/10	0.08 l/min (0.02 US gal/min)	4 l/min (1.06 US gal/min)	8 l/min (2.11 US gal/min)
4	5/32	0.16 l/min (0.04 US gal/min)	8 l/min (2.11 US gal/min)	16 l/min (4.23 US gal/min)
6	1/4	0.4 l/min (0.11 US gal/min)	20 l/min (5.28 US gal/min)	40 l/min (10.57 US gal/min)
8	5/16	0.6 l/min (0.16 US gal/min)	30 l/min (7.93 US gal/min)	60 l/min (15.85 US gal/min)
10	3/8	0.9 l/min (0.24 US gal/min)	45 l/min (11.9 US gal/min)	90 l/min (23.78 US gal/min)
15	1/2	2 l/min (0.53 US gal/min)	100 l/min (26.4 US gal/min)	200 l/min (52.8 US gal/min)
20	3/4	3 l/min (0.79 US gal/min)	150 l/min (39.6 US gal/min)	300 l/min (79.3 US gal/min)
25	1	4 l/min (1.06 US gal/min)	200 l/min (52.8 US gal/min)	400 l/min (106 US gal/min)
32	1 1/4	8 l/min (2.11 US gal/min)	400 l/min (106 US gal/min)	800 l/min (211 US gal/min)
40	1 1/2	12 l/min (3.17 US gal/min)	600 l/min (159 US gal/min)	1200 l/min (317 US gal/min)
50	2	1.2 m ³ /h (5.28 US gal/min)	60 m ³ /h (264 US gal/min)	120 m ³ /h (528 US gal/min)
65	2 1/2	2.4 m ³ /h (10.57 US gal/min)	120 m ³ /h (528 US gal/min)	240 m ³ /h (1057 US gal/min)
80	3	3.6 m ³ /h (15.9 US gal/min)	180 m ³ /h (793 US gal/min)	360 m ³ /h (1585 US gal/min)
100	4	4.8 m ³ /h (21.1 US gal/min)	240 m ³ /h (1057 US gal/min)	480 m ³ /h (2113 US gal/min)

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Sensor

Temperatures

The temperature range of the device depends on various factors. These factors include the medium temperature, the ambient temperature, the operating pressure, the lining material, and the approvals for the Ex-protection.

Storage temperature

-40 to +70 °C (-40 to +158 °F)

Minimum admissible pressure depending on the medium temperature

Lining	Nominal width	p _{Operation} abs	bei T _{Operation} ^a
PFA	DN 3 to 100 (1/10 to 4")	0 mbar	< 180 °C (356 °F)

^a Higher temperatures are admissible for CIP/SIP cleaning for a limited time (see table "Maximum admissible cleaning temperature", page 9).

Maximum admissible cleaning temperature

CIP cleaning	Lining Sensor	T _{max}	T _{max} minutes	T _{Amb}
Steam cleaning	PFA	150 °C (302 °F)	60	25 °C (77 °F)
Liquids	PFA	140 °C (284 °F)	60	25 °C (77 °F)

If the ambient temperature is > 25 °C, the difference must be subtracted from the max. cleaning temperature. $T_{max} - \Delta$ °C.

(Δ °C = $T_{Amb} - 25$ °C)

Maximum admissible temperature shock

Lining	Temp. shock max. temp. diff °C	Temp. gradient °C/min
PFA	Any	Any

Maximum ambient temperature depending on the medium temperature



IMPORTANT (NOTE)!

If the device is used in potentially explosive areas, the additional "Temperature data for operation in zone 1", page 34 and "Temperature data for operation in zone 2", page 38 must be taken into account!

Compact design				
Process connection	Ambient temperature		Medium temperature	
	Minimum	Maximum	Minimum	Maximum ^a
Variable process connections	-20 °C (-4 °F)	60 °C (140 °F) 40 °C (104 °F)	-25 °C (-13 °F)	100 °C (212 °F) 130 °C (266 °F)

^a Higher temperatures are allowed for CIP/SIP cleaning for a limited time. (See table "Maximum admissible cleaning temperature", page 9)

Remote mount design				
Process connection	Ambient temperature		Medium temperature	
	Minimum	Maximum	Minimum	Maximum ^a
Variable process connections	-20 °C (-4 °F)	60 °C (140 °F) 40 °C (104 °F)	-25 °C (-13 °F)	100 °C (212 °F) 130 °C (266 °F)

^a Higher temperatures are allowed for CIP/SIP cleaning for a limited time. (See table "Maximum admissible cleaning temperature", page 9)

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Protection type according to EN 60529

Compact design (internal transmitter)	IP65, IP67 (NEMA X4)
Remote mount design (external transmitter)	IP65, IP67 (NEMA X4), IP68

Pipeline vibration according to EN 60068-2-6

Valid for:

Compact design (With aluminum transmitter housing)	In the range 10 to 58 Hz max. 0.15 mm (0.006") amplitude In the range 58 to 150 Hz max. 2 g acceleration
Remote mount design (Sensor)	In the range 10 to 58 Hz max. 0.15 mm (0.006") amplitude In the range 58 to 150 Hz max. 2 g acceleration

Insertion length

The flanged devices comply with the insertion lengths specified according to VDI/VDE 2641, ISO 13359 or according to DVGW (work sheet W420, design WP, ISO 4064 short).

Signal cable length and preamplifier

For devices in the remote mount design type, the electrical connection between the transmitter and sensor is made via a signal cable.

Transmitter housing design	Single-compartment housing	Ex-zone 2 or outside of Ex-area	
Maximum signal cable length ^a		406015/2-0 406015/2-1	406018/2-0 406018/2-1
Without preamplifier	50 m (164 ft)		
With preamplifier	200 m (656 ft)		
Scope of delivery ^b	5 m (16.4 ft) included		
Signal cable, part no.	00648906		

^a At a minimum conductivity for the measurement medium of $\geq 5 \mu\text{S/cm}$

^b Other available signal cable lengths \Rightarrow see "Available signal cable lengths", page 50

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Materials – sensor housing

		
Housing parts	Standard	Option
Housing Nominal width: DN 3 to 100 (1/10 to 4")	Deep drawn housing, CrNi steel 1.4308 (ASTM)	-
Terminal box	CrNi steel 1.4308 (ASTM)	-
Measuring pipe	Stainless steel ^a	-
Cable fitting^b	Polyamide	-

Parts in contact with the medium	Standard	Option
Process connection Welded socket, Tri-Clamp, etc.	CrNi steel 1.4404 (AISI 316 L)	-
Lining	PFA	-
Measuring and grounding electrode	CrNi steel 1.4539 (AISI 904 L)	Hastelloy C-4 (2.4610)
Seals For welded sockets, compression fittings, Tri-Clamp, external thread	EPDM ^c (ethylene-propylene) – CIP-resistant, no oil and grease	Silicon ^c – resistant to oil and grease

^a 1.4301, 1.4307, 1.4404, 1.4435, 1.4541, 1.4571

ASTM materials:

Grade TP304, TP304 L, TP316 L, TP321, TP316 Ti, TP317 L, 0Cr18Ni9, 00Cr18Ni10, 0Cr17Ni14Mo2, 0Cr27Ni12Mo3, 0Cr18Ni10Ti

^b Cable fitting with M20 × 1.5 or NPT thread.

^c In accordance with FDA 21 CFR 177.

Material load

Limits for the admissible fluid temperature (TS) and admissible pressure (PS) are determined by the used liner and flange materials of the device (see device nameplate).

Process connection	Nominal width	PS _{max} bar (PSI)	TS
Wafer	DN 3 to 50 (1/10" to 2") DN 65 to 100 (2 1/2" to 4")	40 (580) 16 (232)	-25 to +130 °C (-13 to +266 °F)
Welded socket According to DIN 11850	DN 3 to 40 (1/10" to 1 1/2") DN 50, DN 80 (2", 3") DN 65, DN 100 (2 1/2", 4")	40 (580) 16 (232) 10 (145)	-25 to +130 °C (-13 to +266 °F)
Compression fitting According to DIN 11851	DN 3 to 40 (1/10" to 1 1/2") DN 50, DN 80 (2", 3") DN 65, DN 100 (2 1/2", 4")	40 (580) 16 (232) 10 (145)	-25 to +130 °C (-13 to +266 °F)
Tri-Clamp DIN 32676	DN 3 to 50 (1/10" to 2") DN 65 to 100 (2 1/2" to 4")	16 (232) 10 (145)	-25 to +121 °C (-13 to +250 °F)
Tri-Clamp ASME BPE	DN 3 to 100 (1/10" to 4")	10 (145)	-25 to +130 °C (-13 to +266 °F)

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Transmitter

Electrical properties

Voltage supply	AC 100 to 230 V (-15 %/+10 %) AC 24 V (-30 %/+10 %) DC 24 V (-30 %/+30 %), harmonics < 5 %
Supply frequency	47 to 64 Hz
Excitation frequency	6.25 Hz, 7.5 Hz, 12.5 Hz, 15 Hz, 25 Hz, 30 Hz (50/60 Hz voltage supply)
Power consumption	Sensor including transmitter AC S ≤ 20 VA (switch-on current 8.8 A at AC 230 V) DC P ≤ 12 W (switch-on current 5.6 A)
Electrical connection	Screw terminals (maximum 2.5 mm ² – AWG 14)

Galvanic isolation

Current output, digital output (DO1 and DO2), and digital input are galvanically isolated from the sensor input circuit and each other. The same applies for the signal outputs of the versions with PROFIBUS-PA.

Empty pipe detection

Requirements for the function:

- Conductivity of the medium to be measured of ≥ 20 µS/cm
- Signal cable length of ≤ 50 m (164 ft)
- Sensor without preamplifier
- Nominal width DN ≥ DN 10

Mechanical features

Compact design	
Housing	Aluminum casting, painted
Paint	Paint coat ≥ 80 µm thick, RAL 5013 (cobalt blue)
Cable fitting	Polyamide
Remote mount design	
Housing	Aluminum casting, painted
Paint	Paint coat ≥ 80 µm thick, middle section RAL 5013 (cobalt blue) Front lid/rear lid RAL 5013 (cobalt blue)
Cable fitting	Polyamide
Weight	4.5 kg (9.92 lb)

Temperatures

Storage temperature	-40 to +70 °C (-40 to +158 °F)
Ambient temperature	-20 to +60 °C (-4 to +140 °F)

Protection type

Transmitter housing	IP65, IP67 (NEMA 4X)
---------------------	----------------------

Vibration according to EN 60068-2

Valid for:

Remote mount design (Transmitter)	In the range 10 to 58 Hz max. 0.15 mm (0.006") amplitude ^a In the range 58 to 150 Hz max. 2 g acceleration ^a
--------------------------------------	---

^a = Peak load

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Mounting

Grounding

The grounding of the sensor is important both for safety reasons and for the electromagnetic flowmeter to function properly. The grounding screws of the sensor should be connected to protection conductor potential. For measurement reasons, this should be identical to the medium potential as far as possible.

Grounding of the different process connections

Process connection	Grounding
Wafer	For plastic lines or pipelines with insulating lining: via grounding electrodes or grounding plates ^a
Welded socket according to DIN 11850	The measurement medium is grounded via the process connection adapter so that an additional ground is not required.
Compression fitting according to DIN 11851	
Tri-Clamp DIN 32676	
Tri-Clamp ASME BPE	

^a If the pipe section is not free from external interference voltages, it is recommended that one grounding plate is fitted in front of the sensor and one is fitted behind the sensor.

Grounding plates are available upon request ⇒ see "Grounding plates", page 50.

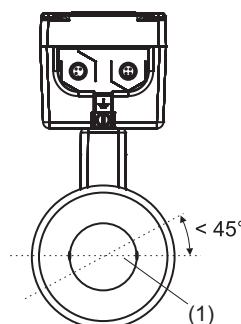
Installation

General information

- The measuring pipe must always be full.
- The flow direction must match the identification marking ⇒ see "Flow direction", page 14.
- The maximum torque for all flange screws must be observed. These must be selected according to factors including temperature, pressure, screw and seal material, and the relevant regulations in each case.
- Install the devices without any mechanical tension (torsion, bending).
- Fit flange devices with plane-parallel counterflanges only using the appropriate seals.
- Use a flange seal made from a material that is compatible with the medium and the medium temperature.
- Seals may not extend into the flow area, since any turbulence affects the device accuracy.
- The pipeline must not exert any inadmissible forces or torque on the device.
- Only remove the sealing plugs in the cable fittings when installing the electrical cables.
- Install remote mount transmitters at a location that is largely free of vibration.
- Do not expose the transmitter to direct sunlight; provide sun protection if necessary.

Electrode axis

- Electrode axis (1) horizontal if possible or rotated max. 45°.



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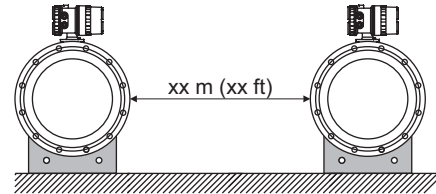
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Minimum clearance

- Maintain a minimum clearance of 0.7 m (2.3 ft) between the devices to prevent any mutually interference.



G01349

Inlet section, outlet section

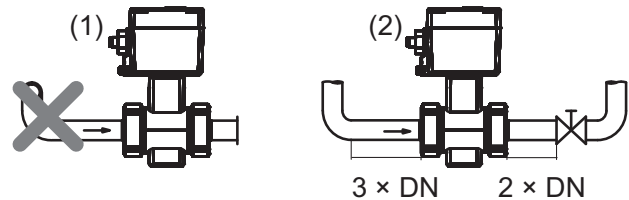
The measuring principle is independent of the flow profile as long as turbulence does not extend into the measurement zone, for example downstream from double elbows (1), in case of tangential inflow or where gate valves are partially open upstream of the sensor.

In these cases, measures must be taken to normalize the flow profile.

- Do not install fittings, elbows or valves, etc. directly upstream of the sensor (1).
- Flaps must be installed so that the flap blade does not extend into the sensor.
- Valves or other shut-off devices should be mounted in the outlet section (2).

Experience has shown that a straight inlet section of $3 \times \text{DN}$ and a straight outlet section of $2 \times \text{DN}$ is sufficient in most cases (DN = nominal width of the sensor – see the adjacent figure).

For test stands, the reference conditions of $10 \times \text{DN}$ for the straight inlet and $5 \times \text{DN}$ for the straight outlet must be provided according to EN 29104/ISO 9104.



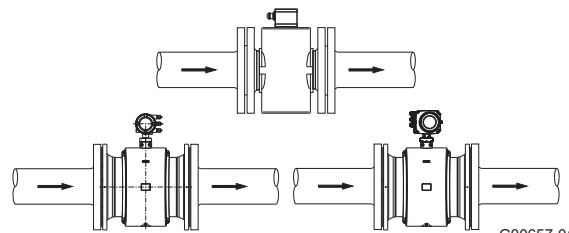
Flow direction

The device records the flow in both directions.

Default setting: forward flow direction

Identification marking:

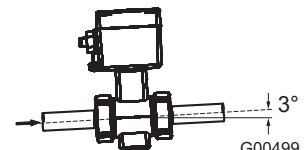
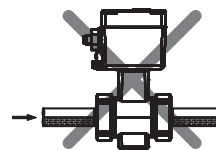
- Arrow direction on the device
- Alignment of the sensor housing during initial startup (default setting) as displayed in the adjacent figures



G00657-01

Horizontal flow direction

- Measuring pipe must always be full.
- Ensure the line is slightly inclined for degassing.



G00499

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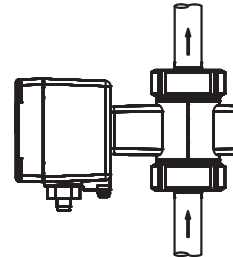
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Vertical flow direction

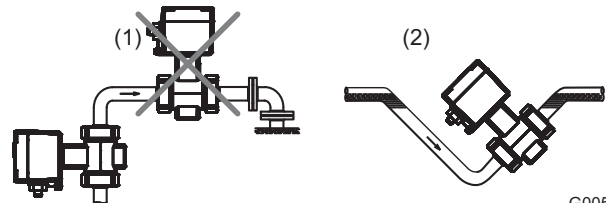
- Vertical installation for measuring abrasive substances, the preferred flow direction is from bottom to top.



G00498

Free inlet, free outlet

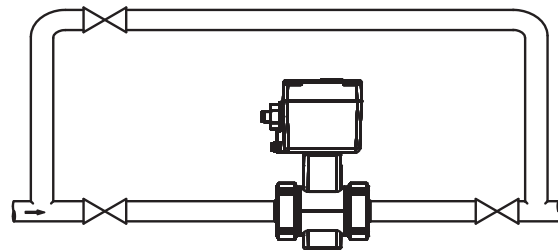
- For a free outlet, do not install the measuring device at the highest point or in the draining side of the pipeline, as the measuring pipe runs empty or air bubbles can form (1).
- For free inlets or outlets, provide a culvert (downward routing of the pipe) so that the pipeline is always full (2).



G00500

Heavily contaminated measurement media

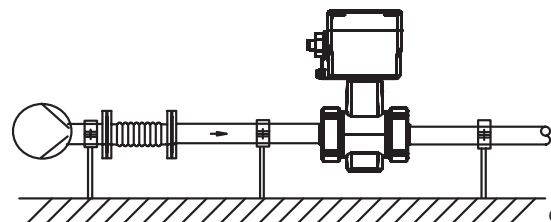
- We recommend a bypass connection, according to the figure, for heavily contaminated measuring media so that the system can continue operating without any interruptions during mechanical cleaning.



G00501

Installation near pumps

- We recommend using mechanical vibration compensators for sensors that are installed near pumps or other equipment generating vibrations.



G00511

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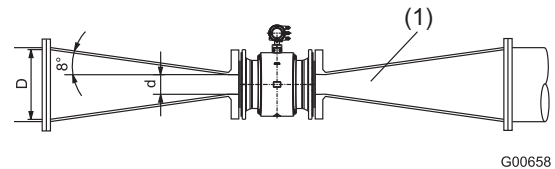
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Installation in pipelines with larger nominal widths

Determine the resulting pressure loss when using reducers (1):

1. Determine the diameter ratio d/D
2. Refer to the flow nomograph for the flow velocity (adjacent figure).
3. Read the pressure loss on the Y-axis in the flow nomogram.



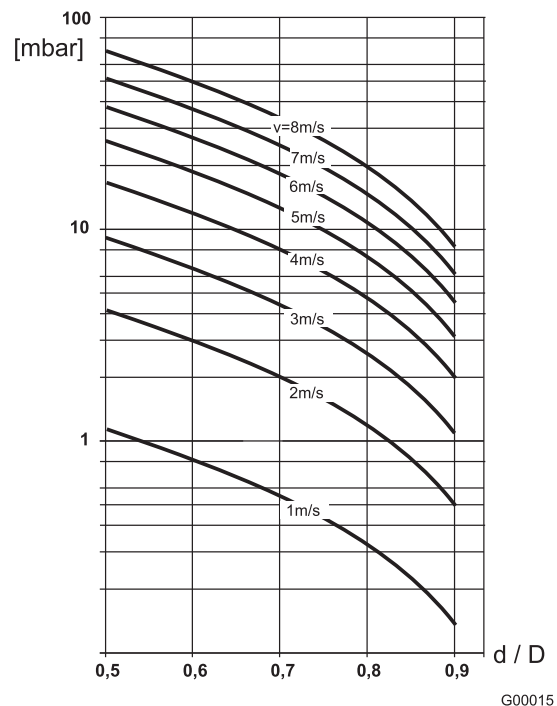
(1) Flange transition piece

(d) Inner diameter of the flowmeter

(D) Inner diameter of the pipeline

Nomograph for pressure loss calculations

For flange transition piece with $\alpha/2 = 8^\circ$



(V) Flow velocity [m/s]

(Δp) Pressure loss [mbar]

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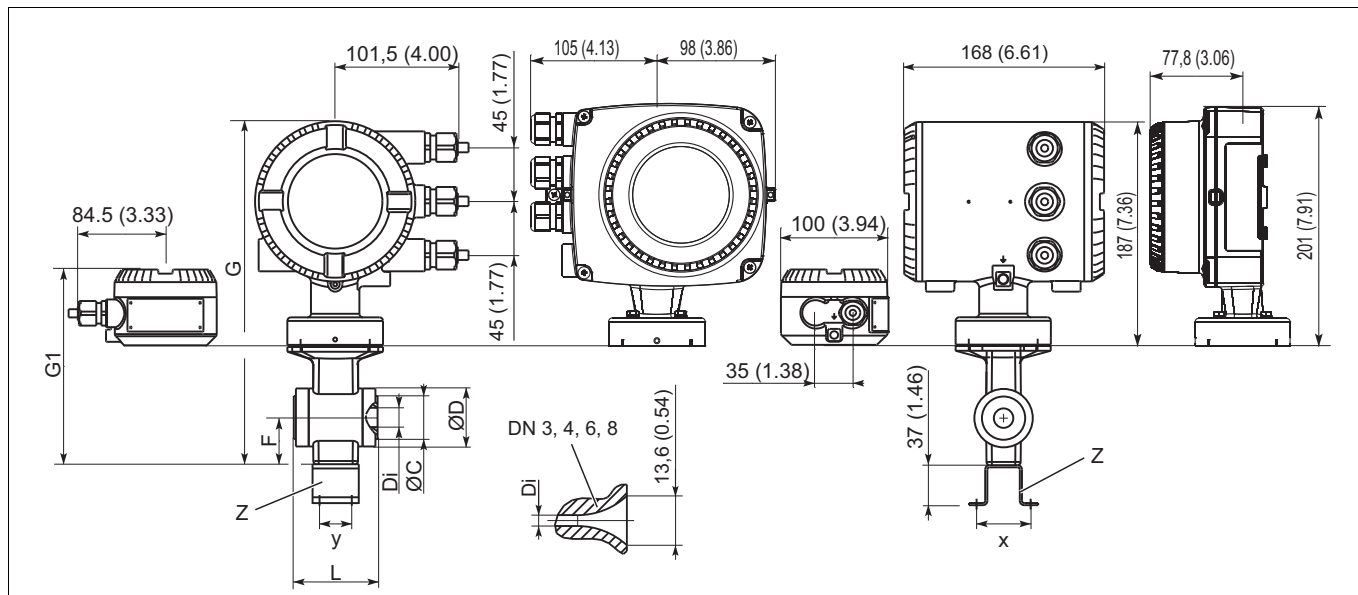
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Dimensions

Wafer DN 3 to 40 (1/10 to 1 1/2")



Dimensions in mm (inch)

Dimensions in mm (inch)									Weight approx. kg (lb)	
DN	Process connection	C	D	Di	F	G ^a	G1 ^a	L ^b	Compact design	Remote mount design
3 to 8 (1/10 to 5/16)	PN 10 to 40 CL150/CL300	42 (1.65)	45 (1.77)	3 to 8 (0.12 to 0.31)	38.5 (1.5)	293 (11.5)	180 (7.1)	68 (2.7)	3.5 (7.7)	1.5 (3.3)
10 (3/8)	PN 10 to 40 CL150/CL300	42 (1.65)	45 (1.77)	10 (0.39)	38.5 (1.5)	293 (11.5)	180 (7.1)	68 (2.7)	3.5 (7.7)	1.5 (3.3)
15 (1/2)	PN 10 to 40 CL150/CL300	42 (1.65)	45 (1.77)	13 (0.51)	38.5 (1.5)	293 (11.5)	180 (7.1)	68 (2.7)	3.5 (7.7)	1.5 (3.3)
20 (3/4)	PN 10 to 40 CL150/CL300	50 (1.97)	54 (2.13)	18 (0.71)	43 (1.7)	302 (11.9)	190 (7.5)	78 (3.1)	4 (8.8)	2 (4.4)
25 (1)	PN 10 to 40 CL150/CL300	59 (2.32)	63 (2.48)	24 (0.94)	48 (1.9)	311 (12.2)	199 (7.8)	90 (3.5)	4.5 (9.9)	2.5 (5.5)
32 (1 1/4)	PN 10 to 40 CL150/CL300	69 (2.72)	73 (2.87)	30 (1.18)	53 (2.1)	321 (12.6)	208 (8.2)	98 (3.9)	4.5 (9.9)	2.5 (5.5)
40 (1 1/2)	PN 10 to 40 CL150/CL300	77 (3.03)	82 (3.23)	36 (1.42)	57 (2.2)	330 (13)	217 (8.5)	103 (4.1)	5 (11)	3 (6.6)

^a The dimensions for the device version with Ex-protection in zone 1 change according to the following table.

^b Tolerance L: +0/-3 mm (+0/-0.118 inches)

Device version	Dimension G in mm (inch)	Dimension G1 in mm (inch)
Ex-protection zone 1	+74 (+2.91)	unavailable

Mounting bracket Z (optional extra) – unavailable for 3A approval

Nominal width	Mounting hole spacing x in mm (inch)	Mounting hole spacing y in mm (inch)
DN 3 to 20	28 (1.1)	50 (1.97)
DN 25 to 40	46 (1.81)	70 (2.76)

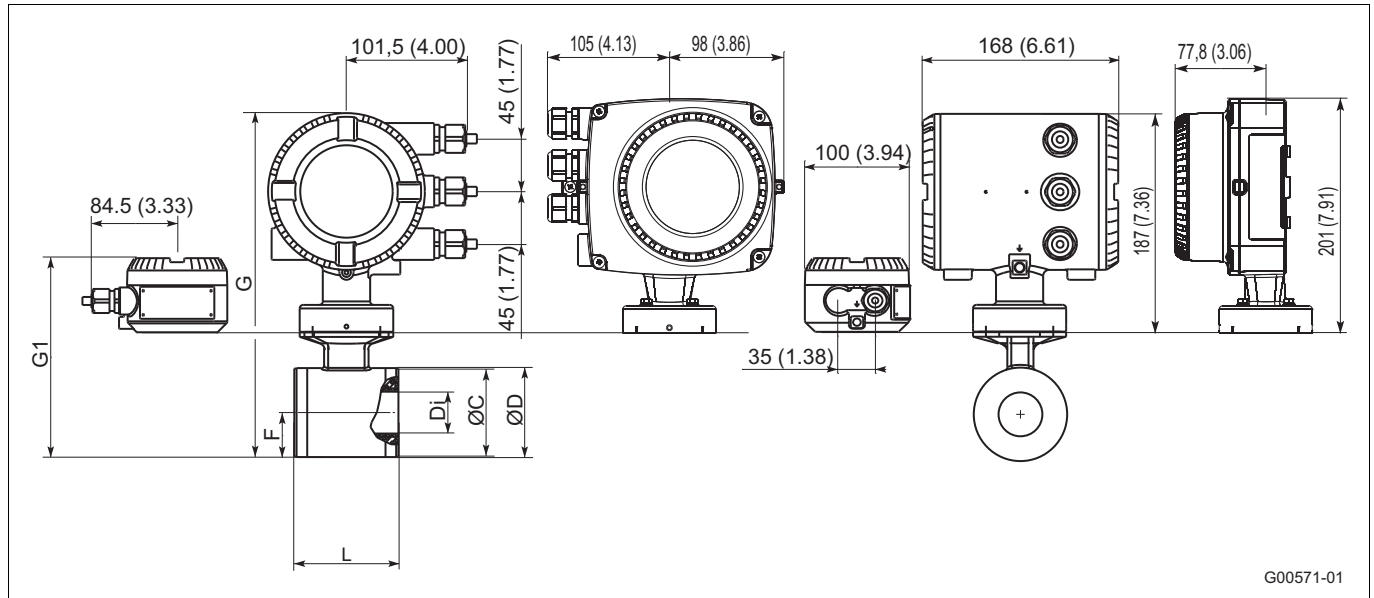
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Wafer DN 50 to 100 (2 to 4")



Dimensions in mm (inch)

Dimensions in mm (inch)									Weight approx. kg (lb)	
DN	Process connection	C	D	Di	F	G ^a	G1 ^a	L ^b	Compact design	Remote mount design
50 (2)	PN 10 to 40	95 (3.74)	100 (3.94)	47 (1.85)	50 (1.97)	332 (13.07)	213 (8.39)	117 (4.61)	6.5 (14.5)	4.5 (10)
	CL150/CL300									
65 (2 1/2)	PN 16	111 (4.37)	116 (4.57)	62 (2.44)	58 (2.28)	348 (13.70)	235 (9.25)	200 (7.87)	7 (15.5)	5 (11)
	CL150									
80 (3)	PN 16	128 (5.04)	133 (5.24)	74 (2.91)	66.5 (2.62)	365 (14.37)	252 (9.92)	200 (7.87)	8.5 (19)	6.5 (14.5)
	CL150									
100 (4)	PN 16	155 (6.10)	160 (6.30)	96 (3.78)	80.2 (3.16)	392 (15.43)	280 (11.02)	250 (9.84)	11 (24)	9 (20)
	CL150									

^a The dimensions for the device version with Ex-protection in zone 1 change according to the following table.

^b Tolerance L: +0/-3 mm (+0/-0.118 inches)

Device version	Dimension G in mm (inch)	Dimension G1 in mm (inch)
Ex-protection zone 1	+74 (+2.91)	unavailable

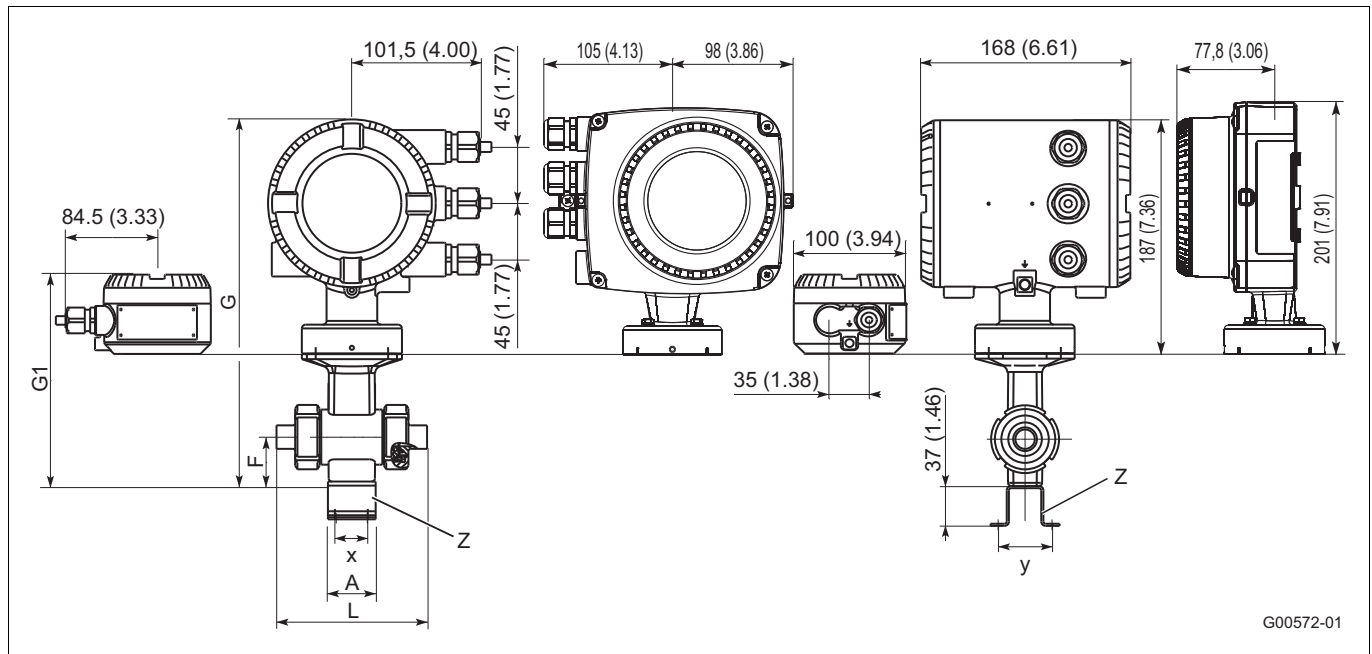
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Variable process connections DN 3 to 40 (1/10 to 1 1/2")



G00572-01

Dimensions in mm (inch)

Insertion length **L** including process connection ⇒ see chapter "Adapter for variable process connections DN 3 to 100 (1/10 to 4")", page 21.

Dimensions in mm (inch)						Weight ^a approx. kg (lb)	
DN	Process connection	A	F	G ^b	G1 ^a	Compact design	Remote mount design
3 to 8 (1/10 to 5/16)	PN 10 to 40	37 (1.65)	38.5 (1.5)	293 (11.5)	180 (7.1)	4 (8.8)	2 (4.4)
10 (3/8)	PN 10 to 40	37 (1.65)	38.5 (1.5)	293 (11.5)	180 (7.1)	4 (8.8)	2 (4.4)
15 (1/2)	PN 10 to 40	37 (1.65)	38.5 (1.5)	293 (11.5)	180 (7.1)	4 (8.8)	2 (4.4)
20 (3/4)	PN 10 to 40	42 (1.65)	43 (1.7)	302 (11.9)	190 (7.5)	4.5 (9.9)	2.5 (5.5)
25 (1)	PN 10 to 40	54 (2.13)	48 (1.9)	311 (12.2)	199 (7.8)	5 (11)	3 (6.6)
32 (1 1/4)	PN 10 to 40	62 (2.44)	53 (2.1)	321 (12.6)	208 (8.2)	5 (11)	3 (6.6)
40 (1 1/2)	PN 10 to 40	67 (2.64)	57 (2.2)	330 (13)	217 (8.5)	5.5 (12)	3.5 (7.7)

^a Plus weight of process connection ⇒ see chapter "Adapter for variable process connections DN 3 to 100 (1/10 to 4")", page 21.

^b The dimensions for the device version with Ex-protection in zone 1 change according to the following table.

Device version	Dimension G in mm (inch)	Dimension G1 in mm (inch)
Ex-protection zone 1	+74 (+2.91)	unavailable

Mounting bracket Z (optional extra) – unavailable for 3A approval

Nominal width	Mounting hole spacing x in mm (inch)	Mounting hole spacing y in mm (inch)
DN 3 to 20	28 (1.1)	50 (1.97)
DN 25 to 40	46 (1.81)	70 (2.76)

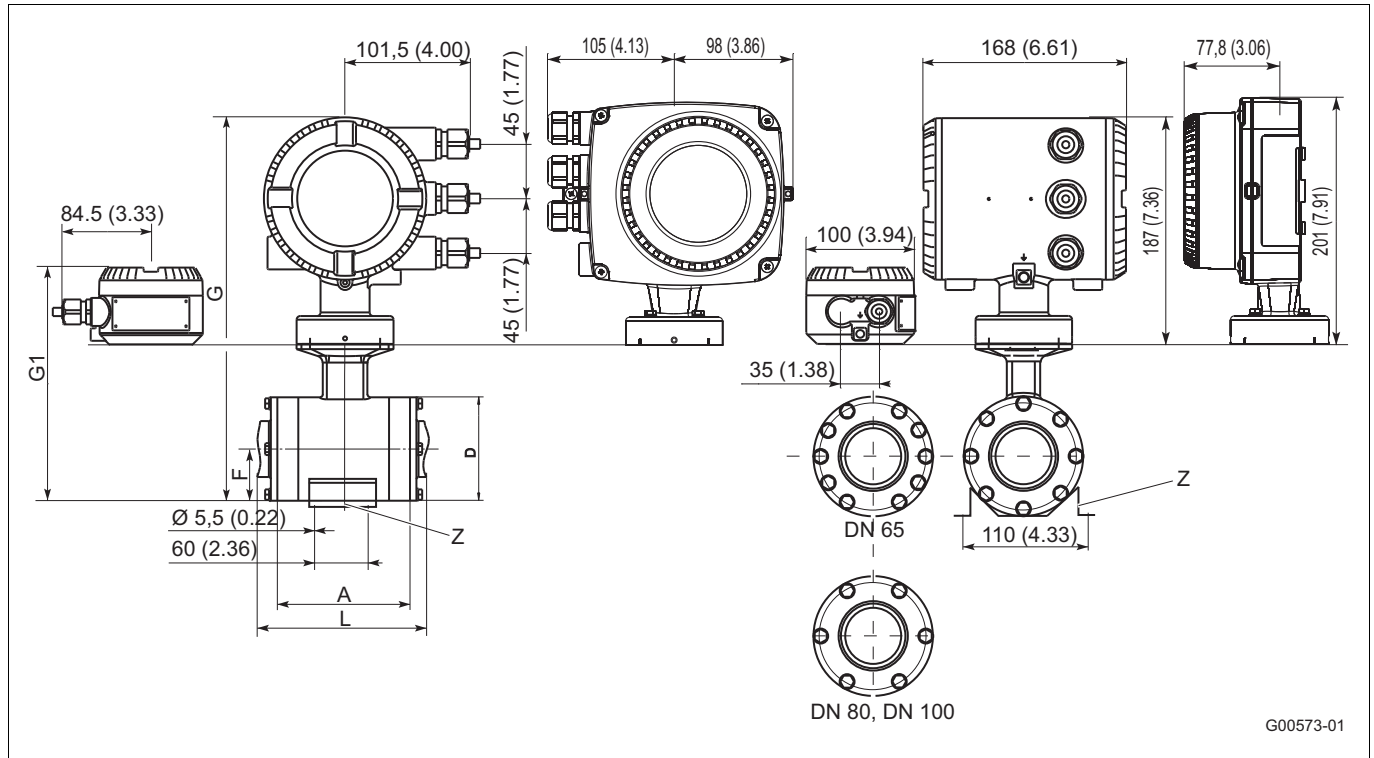
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Variable process connections DN 50 to 100 (2 to 4")



Dimensions in mm (inch)

Insertion length **L** including process connection ⇒ see chapter "Adapter for variable process connections DN 3 to 100 (1/10 to 4")", page 21.

Mounting bracket **Z** (optional extra) – unavailable for 3A approval

Dimensions in mm (inch)						Weight ^a approx. kg (lb)	
DN	Process connection	A	F	G ^b	G1 ^a	Compact design	Remote mount design
50 (2)	PN 10 to 40	128 (5.04)	50 (1.97)	332 (13.06)	213 (8.39)	4 (8.8)	2 (4.4)
65 (2 1/2)	PN 10 to 40	200 (7.87)	58 (2.28)	348 (13.70)	235 (9.26)	4 (8.8)	2 (4.4)
80 (3)	PN 10 to 40	200 (7.87)	67 (2.64)	365 (14.37)	252 (9.92)	4 (8.8)	2 (4.4)
100 (4)	PN 10 to 40	250 (9.84)	81 (3.19)	393 (15.45)	280 (11.01)	4.5 (9.9)	2.5 (5.5)

^a Plus weight of process connection ⇒ see chapter "Adapter for variable process connections DN 3 to 100 (1/10 to 4")", page 21.

^b The dimensions for the device version with Ex-protection in zone 1 change according to the following table.

Device version	Dimension G in mm (inch)	Dimension G1 in mm (inch)
Ex-protection zone 1	+74 (+2.91)	unavailable

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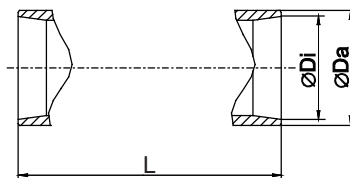
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Adapter for variable process connections DN 3 to 100 (1/10 to 4")

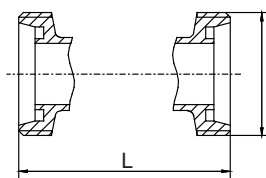
Welded socket DIN 11850



Dimensions in mm (inch)					Weight
DN	Ø DI	Ø Da	Row	L ^a	kg (lb)
3 to 10 (1/10 to 3/8)	10 (0.39)	13 (0.51)	2	127 (5)	0.4 (0.9)
15 (1/2)	16 (0.63)	19 (0.75)	2	127 (5)	0.4 (0.9)
20 (3/4)	20 (0.79)	23 (0.91)	2	132 (5.20)	0.7 (1.5)
25 (1)	26 (1.02)	29 (1.14)	2	149 (5.87)	0.7 (1.5)
32 (1 1/4)	32 (1.26)	34 (1.34)	1	166 (6.54)	1 (2.2)
40 (1 1/2)	38 (1.50)	41 (1.61)	2	171 (6.73)	1 (2.2)
50 (2)	50 (1.97)	53 (2.09)	3	173 (6.81)	1 (2.2)
65 (2 1/2)	66 (2.60)	70 (2.76)	2	251 (9.88)	1.4 (3.1)
80 (3)	81 (3.19)	85 (3.35)	2	255 (10.04)	2 (4.4)
100 (4)	100 (4)	104 (3.94)	2	305 (12.01)	3 (6.6)

^a Tolerance L: +0/-3 mm (+0/-0.118")

Compression fitting DIN 11851



Dimensions in mm (inch)			Weight
DN	Round thread	L ^a	kg (lb)
3 to 10 (1/10 to 3/8)	28 × 1/8" (1.10 × 1/8")	169 (6.65)	0.5 (1.1)
15 (1/2)	34 × 1/8" (1.34 × 1/8")	169 (6.65)	0.5 (1.1)
20 (3/4)	44 × 1/6" (1.73 × 1/6")	180 (7.09)	0.9 (2)
25 (1)	52 × 1/6" (2.05 × 1/6")	207 (8.15)	0.9 (2)
32 (1 1/4)	58 × 1/6" (2.28 × 1/6")	230 (9.06)	1.4 (3.1)
40 (1 1/2)	65 × 1/6" (2.56 × 1/6")	237 (9.33)	1.4 (3.1)
50 (2)	78 × 1/6" (3.07 × 1/6")	243 (9.57)	1.4 (3.1)
65 (2 1/2)	96 × 1/6" (3.78 × 1/6")	331 (13.03)	2.2 (3.1)
80 (3)	110 × 1/4" (4.33 × 1/4")	345 (13.58)	3.2 (4.4)
100 (4)	130 × 1/4" (5.12 × 1/4")	413 (16.26)	4.4 (6.6)

^a Tolerance L: +0/-3 mm (+0/-0.118")

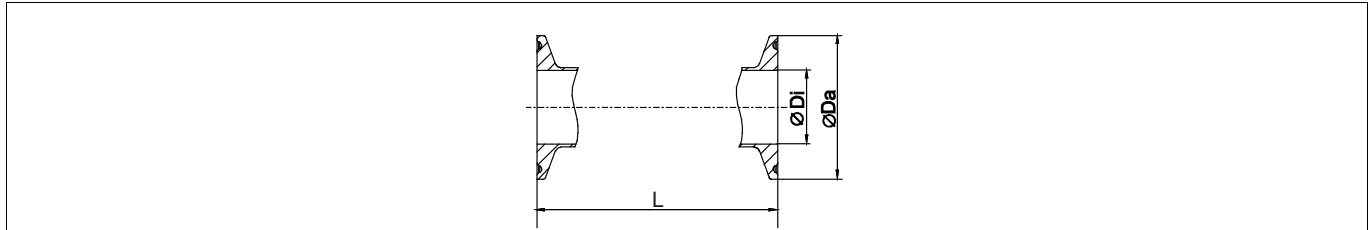
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Tri-Clamp DIN 32676 and ASME BPE



Tri-Clamp according to DIN 32676

Dimensions in mm (inch)					Weight
DN	Ø DI	Ø Da	Row	L ^a	kg (lb)
3 to 10 (1/10 to 3/8)	10 (0.39)	34 (1.34)	3	163 (6.42)	0.5 (1.1)
15 (1/2)	16 (0.63)	34 (1.34)	3	163 (6.42)	0.5 (1.1)
20 (3/4)	20 (0.79)	34 (1.34)	3	168 (6.61)	0.7 (1.5)
25 (1)	26 (1.02)	50 (1.99)	3	192 (7.56)	0.8 (1.8)
32 (1 1/4)	32 (1.26)	50 (1.99)	3	209 (8.23)	1.5 (3.3)
40 (1 1/2)	38 (1.50)	50 (1.99)	3	214 (8.43)	1.4 (2.7)
50 (2)	50 (1.97)	64 (2.52)	3	216 (8.50)	1.2 (2.2)
65 (2 1/2)	66 (2.60)	91 (3.58)	1	307 (12.09)	1.6 (3.5)
80 (3)	81 (3.19)	106 (4.17)	1	311 (12.24)	2.4 (5.3)
100 (4)	100 (4)	119 (4.69)	1	361 (14.21)	3.1 (6.8)

^a Tolerance L: +0/-3 mm (+0/-0.118")

Tri-Clamp according to ASME BPE

Dimensions in mm (inch)					Weight
DN	Tri-Clamp	Ø DI	Ø Da	L ^a	kg (lb)
3 to 10 (1/10 to 3/8)	1/2"	9.4 (0.37)	25 (0.98)	143 (5.63)	0.5 (1.1)
15 (1/2)	3/4"	15.7 (0.62)	25 (0.98)	143 (5.63)	0.5 (1.1)
20 (3/4)	1"	22.1 (0.87)	50.4 (1.98)	143 (5.63)	0.7 (1.5)
25 (1)	1"	22.1 (0.87)	50.4 (1.98)	143 (5.63)	1.2 (2.7)
32 (1 1/4)	-	-	-	-	-
40 (1 1/2)	1 1/2"	34.8 (1.37)	50.4 (1.98)	277 (10.91)	1.8 (4)
50 (2)	2"	47.5 (1.87)	63.9 (2.52)	277 (10.91)	1.8 (4)
65 (2 1/2)	2 1/2"	60.2 (2.37)	77.4 (3.05)	277 (10.91)	2.0 (4.5)
80 (3)	3"	72.9 (2.87)	90.9 (3.58)	337 (13.27)	3.6 (8)
100 (4)	4"	97.4 (3.83)	118.9 (4.68)	337 (13.27)	4.1 (8.8)

^a Tolerance L: +0/-3 mm (+0/-0.118")

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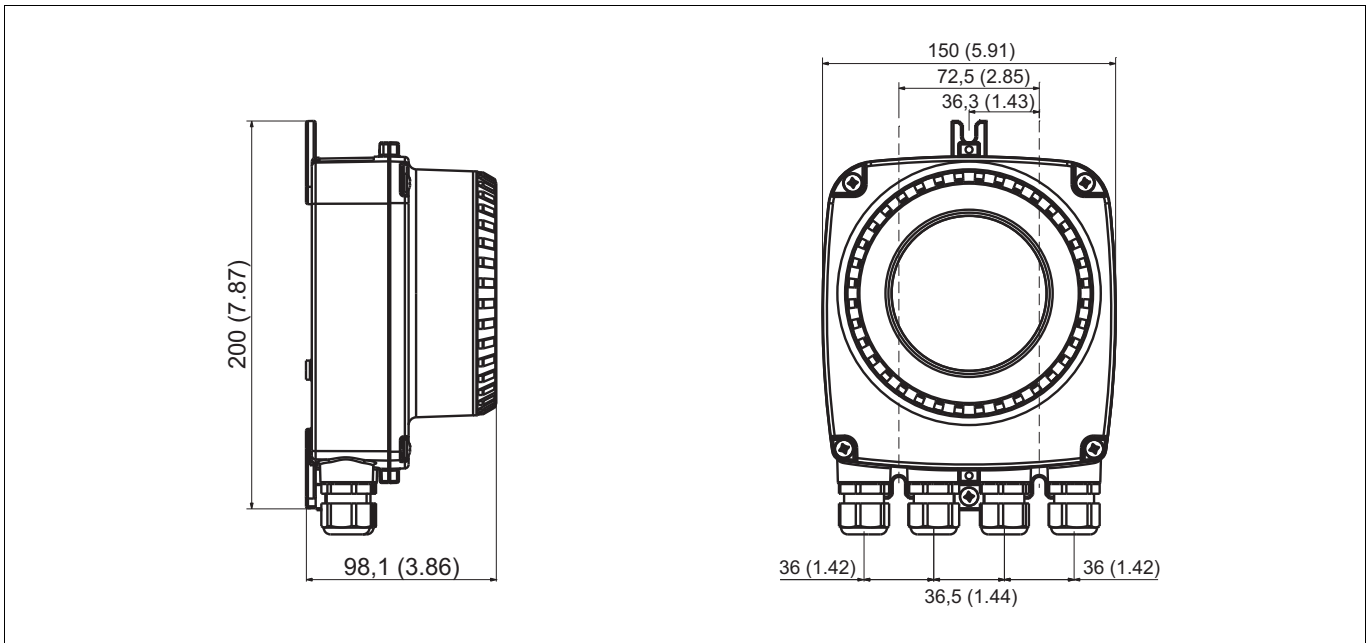
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**Dimensions of single-compartment housing transmitter model 406018/2-0 and 401618/2-1**

For use in Ex-zone 2 and outside of the Ex-area



Dimensions in mm (inch)

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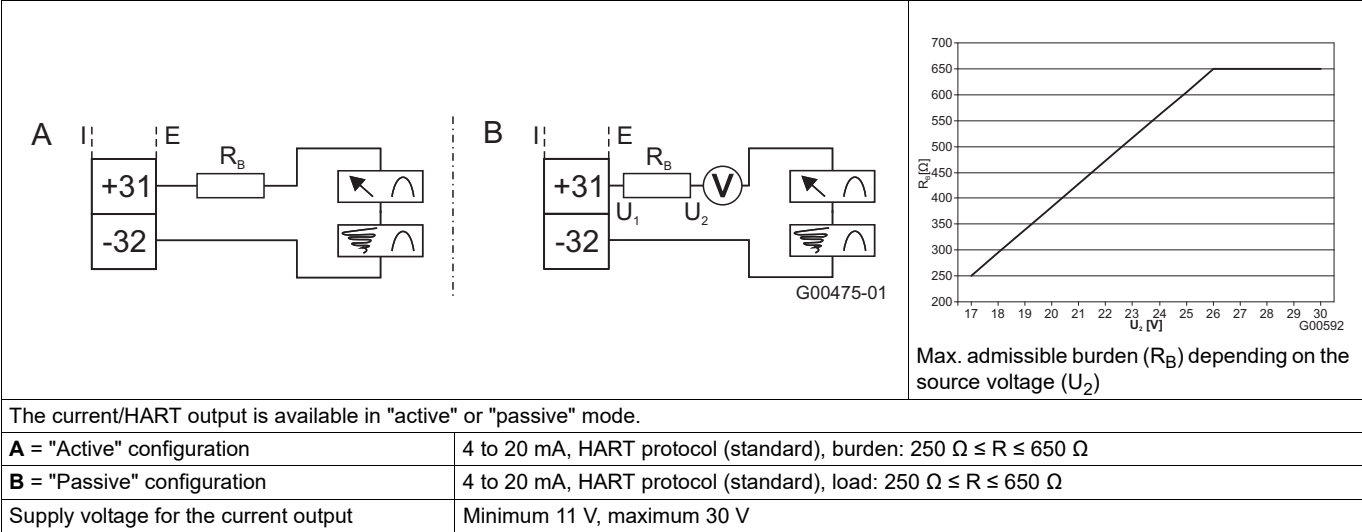
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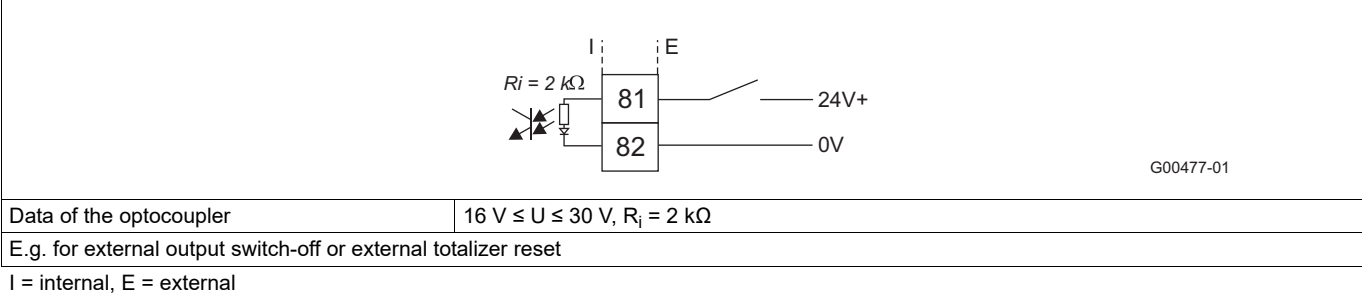


Electrical data

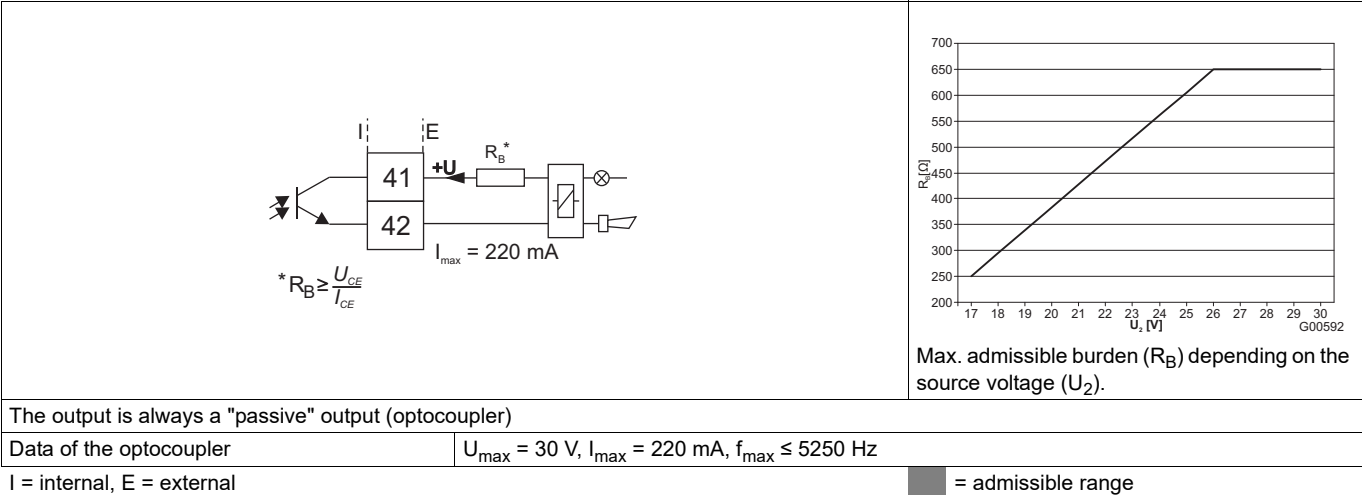
Current/HART output



Digital input DI1

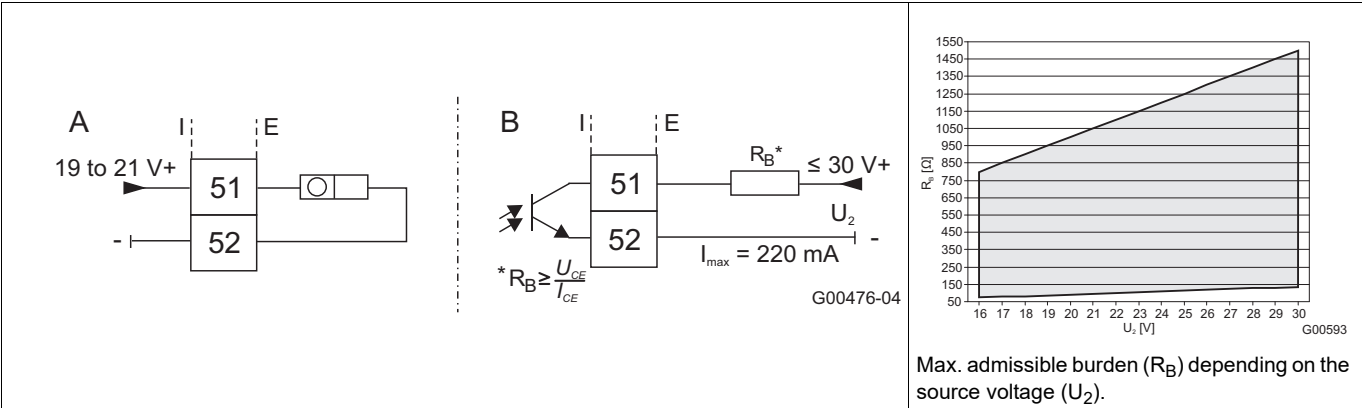


Digital output DO2





Digital output DO1



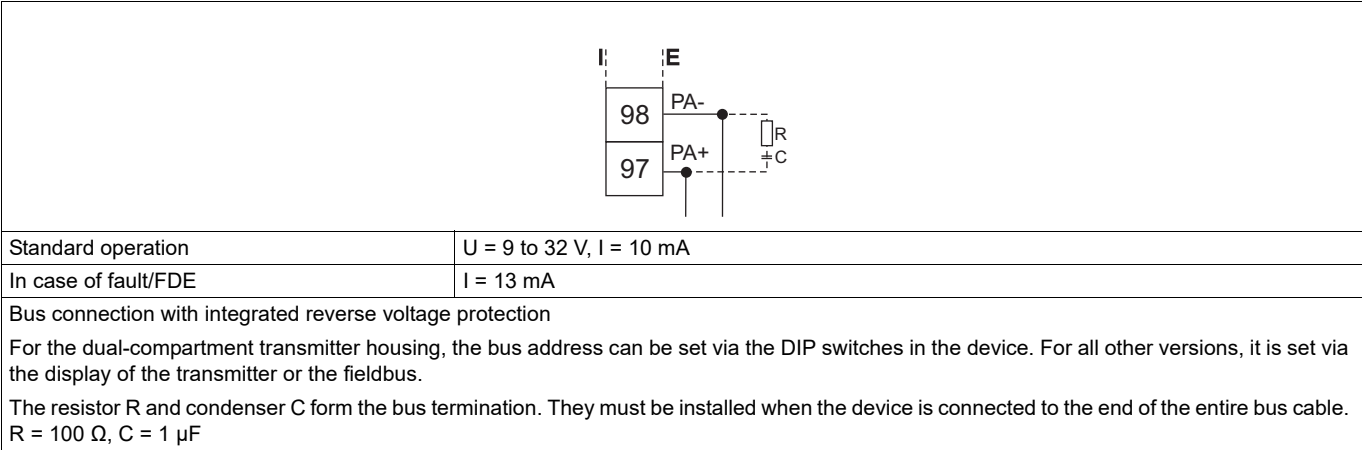
The output can be configured as an "active" or a "passive" output. For a transmitter with the dual-compartment housing, the configuration is performed using the software. For a transmitter with the single-compartment housing, the configuration is performed using jumpers on the transmitter backplane.

A = "Active" configuration	$U = 19 \text{ to } 21 \text{ V}$, $I_{\text{max}} = 220 \text{ mA}$, $f_{\text{max}} \leq 5250 \text{ Hz}$
B = "Passive" configuration	$U_{\text{max}} = 30 \text{ V}$, $I_{\text{max}} = 220 \text{ mA}$, $f_{\text{max}} \leq 5250 \text{ Hz}$
Configuration as pulse output	Maximum pulse frequency: 5250 Hz Pulse width: 0.1 to 2000 ms The pulse factor and pulse width are interdependent and are calculated dynamically.
Configuration as switching output	Function: system alarm, empty pipe alarm, max./min. alarm, flow direction signaling, other

I = internal, E = external

▨ = admissible range

PROFIBUS-PA (PA+/PA-) according to IEC 61158-2



I = internal, E = external

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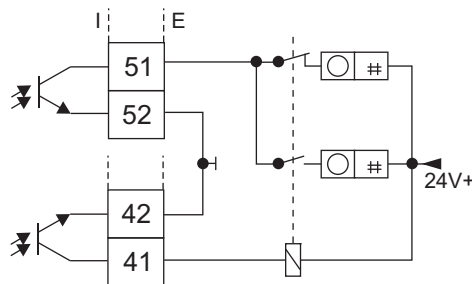
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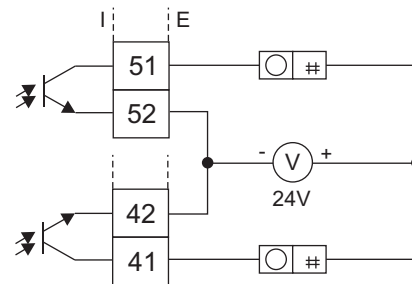
Connection examples

Digital output DO1 and DO2

Separate forward and reverse pulses



Separate forward and reverse pulses (connection type)

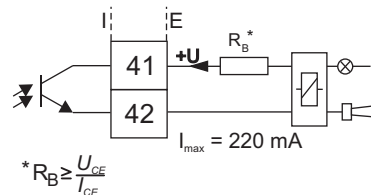


G00791

I = internal, E = external

Digital output DO2

E.g. for system monitoring, max./min. alarm, empty pipe alarm, forward/backward signal, or counting pulses (can be configured using software)

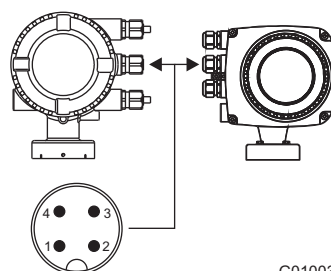


G00792-01

I = internal, E = external

Digital communication – PROFIBUS-PA

Connection via M12 plug (only in non-potentially explosive areas!)



G01003-01

Pin assignment (view from front showing pin insert and pins):

- PIN 1 = PA+
- PIN 2 = nc
- PIN 3 = PA-
- PIN 4 = Shield

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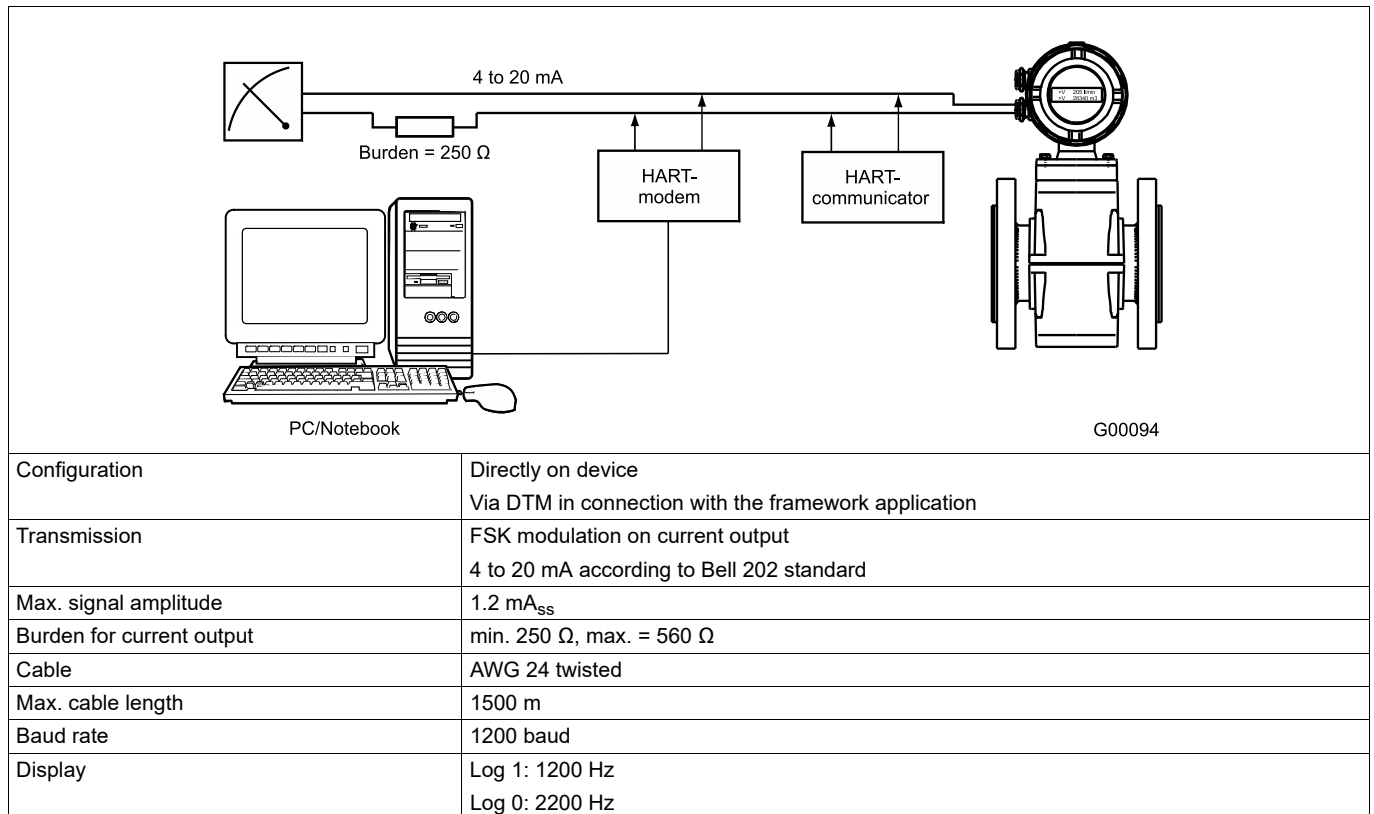
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Digital communication

HART protocol

The transmitter uses HART protocol (HART 5) for digital communication.



For further information ⇒ see the separate interface description.

System integration

The communication (configuration, parameterization) can be carried out in conjunction with the DTM (Device Type Manager) available for the device and the corresponding framework applications according to FDT 1.2.1.

The necessary device DTM is included on the CD and can be downloaded from www.jumo.de.

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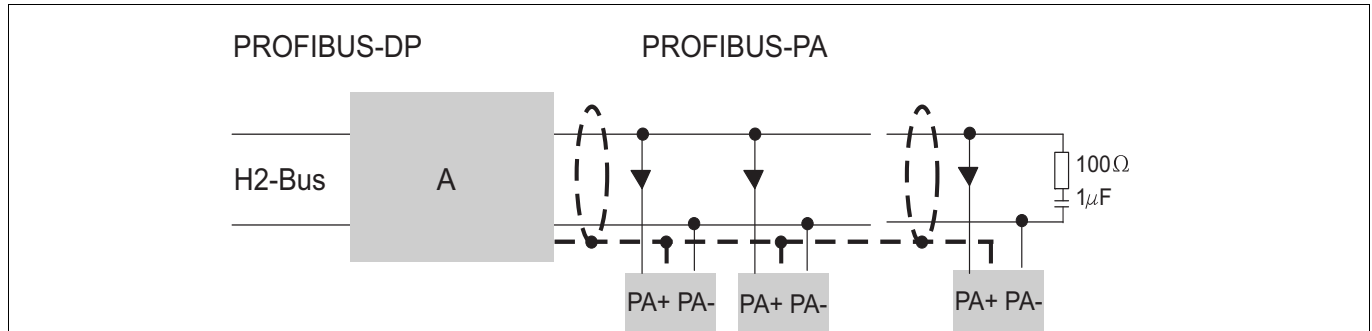
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PROFIBUS-PA protocol

The interface complies with profile 3.01 (standard PROFIBUS, EN 50170, DIN 19245 [PRO91]).



A = Segment coupler (including bus supply and termination)

PROFIBUS-PA ID no.:	0x3430
Alternative standard ID no.:	0x9700 or 0x9740
Configuration	Directly on device Via DTM in connection with the framework application
Transmission signal	According to IEC 61158-2
Cable	Shielded, twisted (Types A or B are preferred according to IEC 61158-2)
Bus topology	<ul style="list-style-type: none"> Tree and/or line structure Bus termination: passive on both ends of the main bus line (RC element R = 100 Ω, C = 1 μF)
Voltage and current consumption	<ul style="list-style-type: none"> Average current consumption: 10 mA In case of a fault, the FDE (fault disconnection electronic) function integrated into the device ensures that the current consumption can rise to a maximum of 13 mA. The upper limit of the current is electronically limited. The voltage on the bus line must be in the range between DC 9 and 32 V.

For further information ⇒ see the separate interface description.

System integration

JUMO provides device GSD files for system integration.

The necessary device DTM is included on the CD and can be downloaded from www.jumo.de.

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Operation in potentially explosive areas zone 1, 21, 22

General information

The following models are approved for operation in potentially explosive areas according to ATEX/IECEx zone 1, 21, 22:

JUMO flowTRANS MAG H01 – compact design

406015/1-1

Transmitter: dual-compartment housing



ATEX/IECEx

Gas zone 1

Dust zone 21, 22



IMPORTANT (NOTE)!

For details about the ATEX/IECEx approvals ⇨ see chapter "Technical data", page 3



IMPORTANT (NOTE)!

The transmitter and sensor housing must be connected to the potential equalization PA before the protection conductor PE is connected. Before connecting the protection conductor PE, the operator must ensure that no potential differences can occur between the potential equalization PA and protection conductor PE.



IMPORTANT (NOTE)!

For the voltage supply, signal inputs, and signal outputs, only use cables with a specification of at least 70 °C (158 °F).

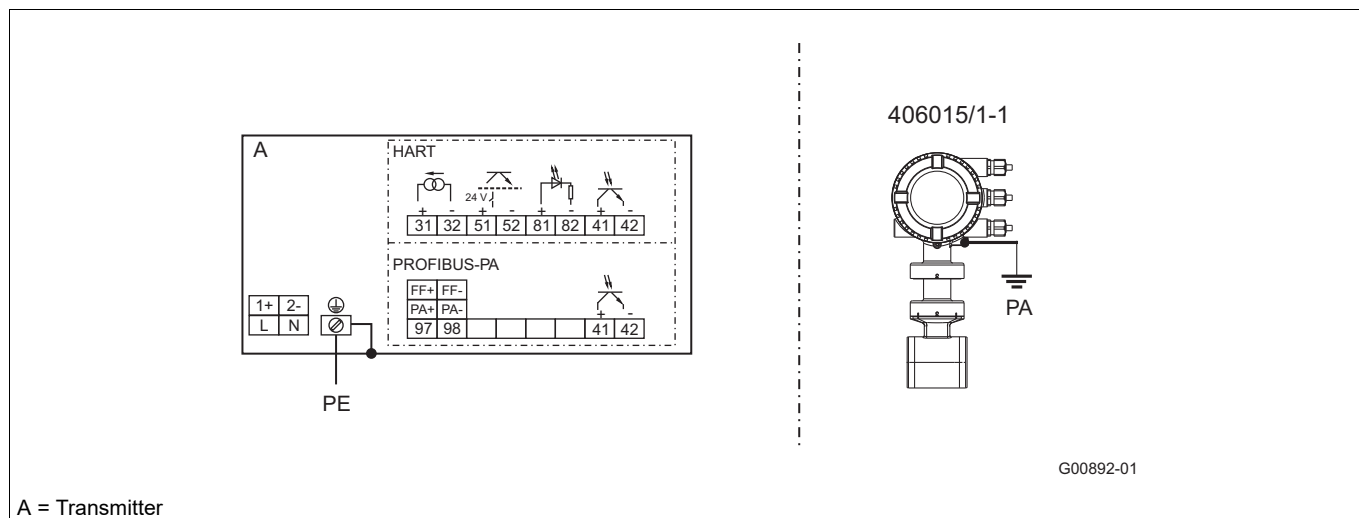
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Model 406015/1-1 in zone 1 – HART protocol and PROFIBUS-PA



A = Transmitter

Voltage supply

Alternating voltage (AC)		Direct voltage (DC)	
Terminal	Function	Terminal	Function
L	Phase	1+	+
N	Neutral conductor	2-	-
PE	Protection conductor (PE)	PE	Protection conductor (PE)

Input and output connection

Terminal	Function
31/32	Current/HART output - The current output is available in "active" or "passive" mode. The configuration must be specified when ordering the unit, since the configuration cannot be changed on-site.
97/98	PROFIBUS-PA (PA+/PA-) - According to IEC 61158-2
51/52	Digital output DO1 active/passive - Function can be configured using software on-site as "Pulse output" or "Binary output". The default setting is "Pulse output".
81/82	Digital input/contact input - Function can be configured using software on-site as "External output switch-off", "External totalizer reset", "External totalizer stop", or "Other". Only available in conjunction with "passive" current output.
41/42	Digital output DO2 passive - Function can be configured using software on-site as "Pulse output" or "Binary output". The default setting is "Binary output", flow direction signaling.
PA	Potential equalization (PA)

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Electrical data

Operation in zone 1 – devices with HART protocol

When operating in potentially explosive areas, observe the following electrical data for the transmitter signal inputs and outputs. For the current output version (active/passive), see the identification marking in the device's terminal box.



IMPORTANT (NOTE)!

Special connection conditions:

The output circuits are designed so that they can be connected to intrinsically safe and non-intrinsically safe electrical circuits. Intrinsically safe and non-intrinsically safe electrical circuits may not be combined. Potential equalization is required for intrinsically safe electrical circuits.

The rated voltage of the non-intrinsically safe electrical circuits is $U_M = 60 \text{ V}$.

If the rated voltage $U_M = 60 \text{ V}$ is not exceeded when non-intrinsically safe electrical circuits are connected, the intrinsic safety is maintained.

Model: 406015/1-1

Inputs and Outputs	Operating data		Ex-data – ignition protection type Ex i, IS											
	U_N [V]	I_N [mA]	U_O [V]	U_I [V]	I_O [mA]	I_I [mA]	P_O [mW]	P_I [mW]	C_O [nF]	C_I [nF]	C_{OPA} [nF]	C_{IPA} [nF]	L_O [mH]	L_I [mH]
Current output active Terminal 31/32	30	30	20	60	100	425 ^a	500	2000 ^a	210	8.4	195	24	6	0.065
Current output passive Terminal 31/32	30	30		60		500 ^a		2000 ^a		8.4		24		170
Digital output DO2 passive Terminal 41/42	30	220		60		425 ^{ab} 500 ^{ac}		2000 ^a		3.6		3.6		170
Digital output DO1 passive Terminal 51/52	30	220		60		425 ^{ab} 500 ^{ac}		2000 ^a		3.6		3.6		170
Digital input DI^d passive Terminal 81/82	30	10		60		500 ^a		2000 ^a		3.6		3.6		170

^a Intrinsically safe single-channel or multichannel barriers (supply isolators) with resistance characteristic curve must be used.

^b For "active" current output.

^c For "passive" current output.

^d Only available in conjunction with passive current output.

All inputs and outputs are galvanically isolated from each other and from the voltage supply.

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Operation in zone 1 – devices with PROFIBUS-PA

When operating in potentially explosive areas, observe the following electrical data for the transmitter signal inputs and outputs. For the (PROFI-BUS-PA) version, see the identification marking in the device's terminal box.



IMPORTANT (NOTE)!

For devices in zone 1, the bus termination must comply with the FISCO model (Fieldbus Intrinsically Safe COnccept) or the explosion protection regulations! For devices in zone 2, the bus termination must comply with the FNICO model (Fieldbus NonIncendive COnccept) or the explosion protection regulations!



IMPORTANT (NOTE)!

Special connection conditions:

The output circuits are designed so that they can be connected to intrinsically safe and non-intrinsically safe electrical circuits. Intrinsically safe and non-intrinsically safe electrical circuits may not be combined. Potential equalization is required for intrinsically safe electrical circuits.

The rated voltage of the non-intrinsically safe electrical circuits is $U_M = 60 \text{ V}$.

If the rated voltage $U_M = 60 \text{ V}$ is not exceeded when non-intrinsically safe electrical circuits are connected, the intrinsic safety is maintained.

Model: 406015/1-1 (dual compartment housing)

The fieldbus and the digital output can be connected in zone 1 in three different variants.

Variant 1: Intrinsically safe fieldbus connection according to FISCO, intrinsically safe digital output connection

Signal inputs and outputs	Operating data		Ex-data – Ex i, IS, and FISCO					
	U_N [V]	I_N [mA]	U_i [V]	I_i [mA]	P_i [mW]	C_i [nF]	C_{iPA} [nF]	L_i [μH]
Digital output DO2 passive Terminal 41/42	30	220	60	200 ^a	5000 ^a	3.6	3.6	0.17
Fieldbus Terminal 97/98	32	30	17	380	5320	1	1	5

^a Single-channel or multichannel barriers (supply isolators) with resistance characteristic curve must be used.

Variant 2: Intrinsically safe fieldbus connection (not according to FISCO!), intrinsically safe digital output connection

Signal inputs and outputs	Operating data		Ex-data – Ex i, IS, and FISCO					
	U_N [V]	I_N [mA]	U_i [V]	I_i [mA]	P_i [mW]	C_i [nF]	C_{iPA} [nF]	L_i [μH]
Digital output DO2 passive Terminal 41/42	30	220	60	200 ^a	5000 ^a	3.6	3.6	0.17
Fieldbus Terminal 97/98	32	30	60	500	5000	1	1	5

^a Single-channel or multichannel barriers (supply isolators) with resistance characteristic curve must be used.

Variant 3: Fieldbus connection according to FNICO (zone 2), digital output connection (zone 2)

Signal inputs and outputs	Operating data		Ex-data – Ex n, NI, and FNICO					
	U_N [V]	I_N [mA]	U_i [V]	I_i [mA]	P_i [mW]	C_i [nF]	C_{iPA} [nF]	L_i [μH]
Digital output DO2 passive Terminal 41/42	30	220	-	-	-	-	-	-
Fieldbus Terminal 97/98	32	30	60	500 ^a	5000 ^a	1	1	5

^a Single-channel or multichannel barriers (supply isolators) with resistance characteristic curve must be used.

All inputs and outputs are galvanically isolated from each other and from the voltage supply.



Temperature data for operation in zone 1

Temperature data for operation in zone 1

Model designation	Surface temperature
406015/1-1	70 °C (158 °F)

The surface temperature depends on the medium temperature.

With an increasing medium temperature > 70 °C (158 °F) or > 85 °C (185 °F), the surface temperature also increases to the level of the medium temperature.



IMPORTANT (NOTE)!

The maximum admissible medium temperature depends on the lining and flange material and is limited by the operating data in table 1 and the explosion-relevant technical data in tables 2 and 3.

Table 1: Medium temperature depending on the lining and flange material

Model 406015/1-1

Lining	Process connection	Material	Medium temperature (operating data)	
			Minimum	Maximum
PFA	Wafer	-	-25 °C (-13 °F)	130 °C (266 °F)
PFA	Variable process connection	Stainless steel	-25 °C (-13 °F)	130 °C (266 °F)

Table 2: Medium temperature (Ex-data) model 406015/1-1



IMPORTANT (NOTE)!

If the installation location for the device is classified as a potentially explosive area for gases and dust, the temperature data in the "Gas & dust" columns in the table must be taken into consideration.

If the installation location for the device is only classified as a potentially explosive area for gases, the temperature data in the "Gas" column in the table must be taken into consideration.

Nominal width	Temperature class	Ambient temperature											
		-20 °C to +40 °C				-20 °C to +50 °C				-20 °C to +60 °C			
		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated	
		Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust
DN3 to 100	T1	130 °C								110 °C	20 °C	80 °C	40 °C
	T2	130 °								110 °C	20 °C	80 °C	40 °C
	T3	130 °C								110 °C	20 °C	80 °C	40 °C
	T4	120 °C								110 °C	20 °C	80 °C	40 °C
	T5	85 °C								85 °C	20 °C	70 °C	40 °C
	T6	70 °C								70 °C	20 °C	70 °C	40 °C

Not thermally insulated: the sensor is not surrounded by pipe insulating material.

Thermally insulated: the sensor is surrounded by pipe insulating material.

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Operation in potentially explosive areas zone 2, 21, 22

General information

The following models are approved for operation in potentially explosive areas according to ATEX/IECEx zone 2, 21, 22:

JUMO flowTRANS MAG H01 – compact design		JUMO flowTRANS MAG H01 – remote mount design	
406015/1-1		406015/2-1 – sensor	406018/2-1 – transmitter
			
Single-compartment housing			Single-compartment housing
ATEX/IECEx Gas zone 2 Dust zone 21, 22		ATEX/IECEx Gas zone 2 Dust zone 21, 22	ATEX/IECEx Gas zone 2 Dust zone 21, 22



IMPORTANT (NOTE)!

For details about the ATEX/IECEx approvals ⇒ see chapter "Technical data", page 3



IMPORTANT (NOTE)!

For the voltage supply, signal inputs, and signal outputs, only use cables with a specification of at least 70 °C (158 °F).

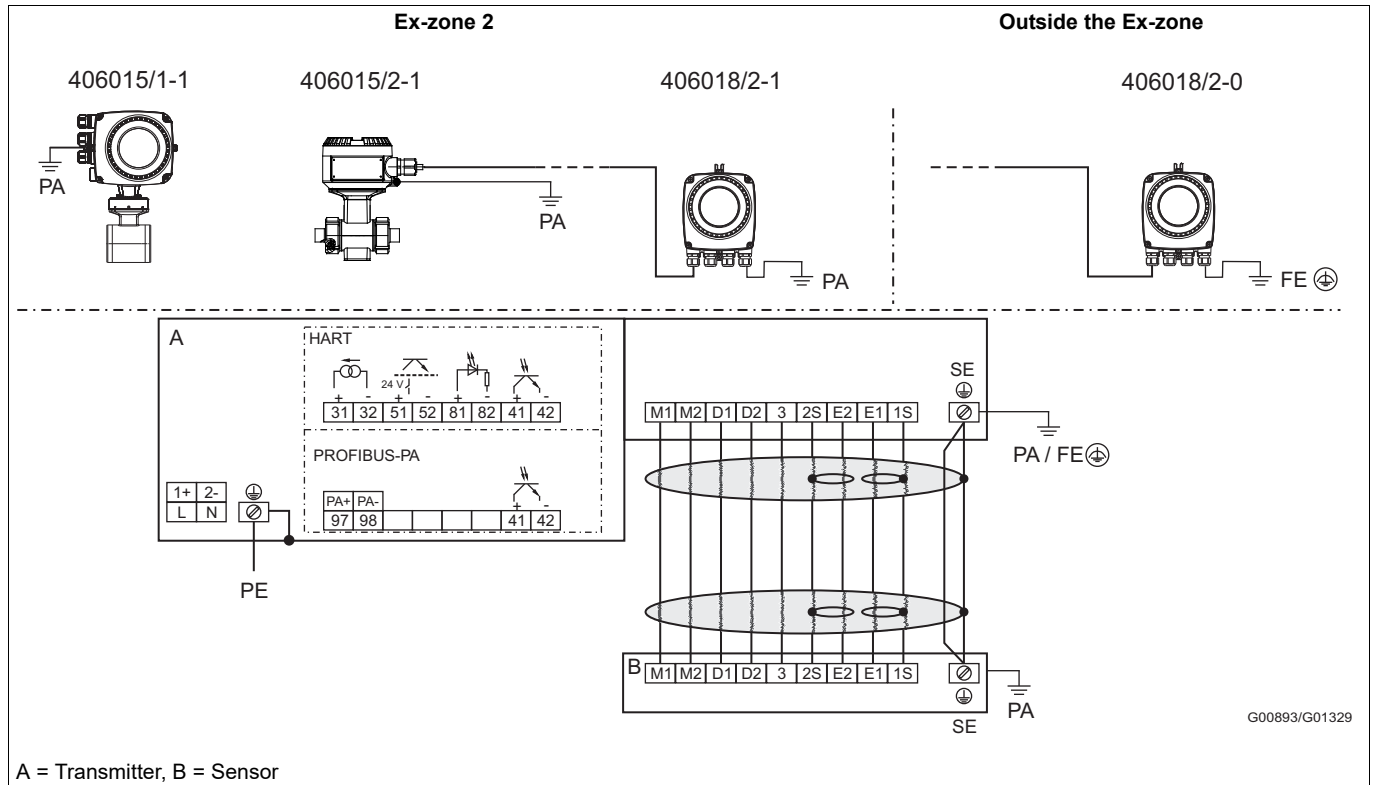
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Model 406015/1-1 and 406015/2-1 with 406018/2-1 in zone 2 and 406018/2-0 outside of the Ex-area – HART protocol and PROFIBUS-PA



Voltage supply

Alternating voltage (AC)		Direct voltage (DC)	
Terminal	Function	Terminal	Function
L	Phase	1+	+
N	Neutral conductor	2-	-
PE	Protection conductor (PE)	PE	Protection conductor (PE)

Signal cable connection (for devices with remote mount design only)

Terminal	Function	Wire color
M1	Magnet coil	Brown
M2	Magnet coil	Red
D1	Data line	Orange
D2	Data line	Yellow
SE	Shielding	-
E1	Signal line	Violet
1S	Shield of E1	-
E2	Signal line	Blue
2S	Shield of E2	-
3	Measurement potential	Green

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Input and output connection

Terminal	Function
31/32	Current/HART output - The current output is available in "active" or "passive" mode.
97/98	PROFIBUS-PA (PA+/PA-) - According to IEC 61158-2
51/52	Digital output DO1 active/passive - Function can be configured using software on-site as "Pulse output" or "Binary output". The default setting is "Pulse output".
81/82	Digital input/contact input - Function can be configured using software on-site as "External output switch-off", "External totalizer reset", "External totalizer stop", or "Other".
41/42	Digital output DO2 passive - Function can be configured using software on-site as "Pulse output" or "Binary output". The default setting is "Binary output", flow direction signaling.
PA	Potential equalization (PA)
FE	Functional ground (only for transmitters outside potentially explosive area)

Electrical data

Electrical data for operation in zone 2 – devices with HART protocol

When operating in potentially explosive areas, observe the following electrical data for the transmitter signal inputs and outputs. For the current output version (active/passive), see the identification marking in the device's terminal compartment.

Model: 406015/1-1 and 406018/2-1 (single-compartment housing)

	Operating data		Ex-data – Ex n/NI	
Signal inputs and outputs	U _i [V]	I _i [mA]	U _i [V]	I _i [mA]
Current output active/passive				
Terminal 31/32	30	30	30	30
Digital output DO1 active/passive				
Terminal 51/52	30	220	30	220
Digital output DO2 passive				
Terminal 41/42	30	220	30	220
Digital input DI				
Terminal 81/82	30	10	30	10

All inputs and outputs are galvanically isolated from each other and from the voltage supply.

Electrical data for operation in zone 2 – devices with PROFIBUS-PA

When operating in potentially explosive areas, observe the following electrical data for the transmitter signal inputs and outputs. For the (PROFIBUS-PA) version, see the identification marking in the device's terminal box.



IMPORTANT (NOTE)!

For devices in zone 2, the bus termination must comply with the FNICO model (Fieldbus NonIncendive COnccept) or the explosion protection regulations.

Model: 406015/1-1 and 406018/2-1 (single-compartment housing)

	Operating data		Ex-data – Ex n/NI and FNICO					
Signal inputs and outputs	U _N [V]	I _N [mA]	U _i [V]	I _i [mA]	P _i [mW]	C _i [nF]	C _{iPA} [nF]	L _i [µH]
Digital output DO2 passive								
Terminal 41/42	30	220	30	-	-	-	-	-
Fieldbus								
Terminal 97/98	32	30	32	500 ^a	7000 ^a	1	1	5

^a Single-channel or multichannel barriers (supply isolators) with resistance characteristic curve must be used.

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Temperature data for operation in zone 2

Temperature data for operation in zone 2

Model designation	Surface temperature
406015/1-1	70 °C (158 °F)
406015/2-1	85 °C (185 °F)
406018/2-1 (single-compartment housing)	70 °C (158 °F)

The surface temperature depends on the medium temperature.

With an increasing medium temperature > 70 °C (158 °F) or > 85 °C (185 °F), the surface temperature also increases to the level of the medium temperature.

Table 1: Medium temperature depending on the lining and flange material

Model 406015/1-1 and 406015/2-1

			Medium temperature (operating data)	
Lining	Process connection	Material	Minimum	Maximum
PFA	Wafer	-	-25 °C (-13 °F)	130 °C (266 °F)
PFA	Variable process connection	Stainless steel	-25 °C (-13 °F)	130 °C (266 °F)

Table 2: Medium temperature (Ex-data) model 406015/1-1



IMPORTANT (NOTE)!

If the installation location for the device is classified as a potentially explosive area for gases and dust, the temperature data in the "Gas & dust" columns in the table must be taken into consideration.

If the installation location for the device is only classified as a potentially explosive area for gases, the temperature data in the "Gas" column in the table must be taken into consideration.

Nominal width	Temperature class	Ambient temperature											
		-20 °C to +40 °C				-20 °C to +50 °C				-20 °C to +60 °C			
		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated	
		Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust
DN3 to 100	T1	130 °C	130 °C	-	-	130 °C	110 °C	-	-	80 °C	40 °C	-	-
	T2	130 °C	130 °C	-	-	130 °C	110 °C	-	-	80 °C	40 °C	-	-
	T3	130 °C	130 °C	-	-	130 °C	110 °C	-	-	80 °C	40 °C	-	-
	T4	130 °C	130 °C	-	-	130 °C	110 °C	-	-	80 °C	40 °C	-	-

Not thermally insulated: the sensor is not surrounded by pipe insulating material.

Thermally insulated: the sensor is surrounded by pipe insulating material.

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Table 3: Medium temperature (Ex-data) model 406015/2-1



IMPORTANT (NOTE)!

The standard version includes Ex-protection for gases and dust.

If the installation location for the device is classified as a potentially explosive area for gases and dust, the temperature data in the "Gas & dust" columns in the table must be taken into consideration.

If the installation location for the device is only classified as a potentially explosive area for gases, the temperature data in the "Gas" column in the table must be taken into consideration.

Nominal width	Temperature class	Ambient temperature											
		-20 °C to +40 °C				-20 °C to +50 °C				-20 °C to +60 °C			
		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated		Not thermally insulated		Thermally insulated	
		Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust	Gas	Gas & dust
DN3 to 100	T1	130 °C	130 °C	-	-	130 °C	100 °C	-	-	120 °C	110 °C	-	-
	T2	130 °C	130 °C	-	-	130 °C	100 °C	-	-	120 °C	110 °C	-	-
	T3	130 °C	130 °C	-	-	130 °C	100 °C	-	-	120 °C	110 °C	-	-
	T4	130 °C	130 °C	-	-	130 °C	100 °C	-	-	120 °C	110 °C	-	-
	T5	95 °C	95 °C	-	-	95 °C	95 °C	-	-	95 °C	95 °C	-	-
	T6	80 °C	80 °C	-	-	80 °C	80 °C	-	-	80 °C	80 °C	-	-

Not thermally insulated: the sensor is not surrounded by pipe insulating material.

Thermally insulated: the sensor is surrounded by pipe insulating material.

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Ex-relevant technical data for operation in areas with combustible dust



IMPORTANT (NOTE)!

The dust explosion protection is guaranteed in part by the housing. The housing may not be modified in any way (e.g. by removing or omitting parts).

Notes on using the device in areas with combustible dust

The device with the transmitter in a single-compartment housing is approved for use in potentially explosive areas (gas and dust).

The Ex identification marking is provided on the nameplate.

Maximum admissible surface temperature



IMPORTANT (NOTE)!

The maximum surface temperature is applicable to dust layers of up to 5 mm (0.20 inches) in thickness. This is to be used to determine the minimum admissible ignition and glow temperature for the dust atmosphere according to IEC 61241ff.

The maximum admissible surface temperature must be reduced for thicker dust layers. The dust may be electrically conductive or non-conductive. IEC 61241ff. must be observed.

Model designation	Surface temperature
406015/1-1	70 °C (158 °F) to T _{Medium}
406015/2-1	85 °C (185 °F) to T _{Medium}
406018/2-1 (single-compartment housing)	70 °C (158 °F)

Minimum signal cable length



IMPORTANT (NOTE)!

The signal cable in potentially explosive areas may not be shorter than 5 m (16.40 ft).

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Order details

Compact or remote mount design (sensor with transmitter)

				(1)	Type
406015					JUMO flowTRANS MAG H01
				(2)	Design
1					Compact
2					Remote mount ^{a, b}
				(3)	Explosion protection
0					Without Ex-protection
1					With Ex-protection
				(4)	Nominal width
X	X	X	X	0003	DN 3
X	X	X	X	0004	DN 4
X	X	X	X	0006	DN 6
X	X	X	X	0008	DN 8
X	X	X	X	0010	DN 10
X	X	X	X	0015	DN 15
X	X	X	X	0020	DN 20
X	X	X	X	0025	DN 25
X	X	X	X	0032	DN 32
X	X	X	X	0040	DN 40
X	X	X	X	0050	DN 50
X	X	X	X	0065	DN 65
X	X	X	X	0080	DN 80
X	X	X	X	0100	DN 100
				(5)	Lining material
X	X	X	X	08	PFA
				(6)	Electrode version
X	X	X	X	1	Standard
X	X	X	X	5	Bullet-nose
X	X	X	X	9	Others upon request
				(7)	Measuring electrode material
X	X	X	X	01	Stainless steel 1.4539 (904)
X	X	X	X	02	NiMo C-4 (2.4610) – Hastelloy
X	X	X	X	04	Tantalum
X	X	X	X	10	Others upon request
				(8)	Grounding accessories
X	X	X	X	1	Standard
X	X	X	X	2	Grounding electrodes ⇨ see (7) measuring electrode material

^a If only the sensor model 406015/2-0 or 406015/2-1 is needed, the order code "Remote mount design (sensor)", page 45 should be used to generate the correct order details.

^b If only the transmitter model 406018/2-0 or 406018/2-1 is needed, the order code "Remote mount design (transmitter)", page 48 should be used to generate the correct order details.

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Compact or remote mount design (sensor with transmitter) – continued

					(9)	Process connection ^a
X	X	X	X	40		Screw connection according to DIN 11851
X	X	X	X	52		Welded socket according to DIN 11850
X	X	X	X	60		Tri-Clamp according to DIN 32676
X	X	X	X	61		Tri-Clamp according to ASME BPE
X	X	X	X	70		Wafer
X	X	X	X	80		Without adapter
					(10)	Process connection material
X	X	X	X	03		Stainless steel with EPDM seal
X	X	X	X	04		Stainless steel with EPDM seal and mounting ^b
X	X	X	X	09		Without process connection, without seal, with mounting ^b
X	X	X	X	10		Without process connection, without seal, without mounting ^c
					(11)	Certificates
X	X	X	X	1		Measuring pipe with PED approval
X	X	X	X	3		Inspection certificate 3.1 according to EN 10204
X	X	X	X	4		Pressure test according to AD2000
X	X	X	X	5		Material certification 3.1 according to EN 10204 and pressure test according to AD2000
					(12)	Calibration
X	X	X	X	1		Standard accuracy ^d
X	X	X	X	2		Enhanced accuracy ^e
					(13)	Ambient temperature sensor (10)
X	X	X	X	1		Standard sensor design/-20 to +60 °C (-4 to +140 °F) ^f
					(14)	Nameplate
X	X	X	X	1		Adhesive label
X	X	X	X	2		Stainless steel
X	X	X	X	9		Others upon request
					(15)	Signal cable length
X	X	X	X	0		None
	X	X	X	1		5 m standard cable
	X	X	X	2		10 m standard cable
	X	X	X	3		20 m standard cable
	X	X	X	4		30 m standard cable
	X	X	X	5		50 m standard cable
	X	X	X	6		80 m standard cable
	X	X	X	7		100 m standard cable
	X	X	X	8		150 m standard cable
	X	X	X	9		Others upon request
					(16)	Ex-zone
X	X	X		0		None
X			X	1		ATEX/IECEx zone 1 ^g
X	X		X	2		ATEX/IECEx zone 2/21

^a Available nominal widths of different process connections ⇒ see chapter "Dimensions", page 17.

^b 3A conformity not available.

^c 3A conformity not available. Specify with process connection "Wafer" or with process connection "without adapter".

^d Standard accuracy (0.4 % of the measured value) includes 2 calibration points. If more than 2 calibration points are required, specify 3 or 5 points under "Number of test points".

^e Enhanced accuracy (0.2 % of the measured value) includes 3 calibration points. If more than 3 calibration points are required, specify 5 points under "Number of test points". Available for DN10 (3/8") to 100 (4").

^f Standard sensor design maximum medium temperature: 130 °C (266 °F) with PFA.

^g Only in conjunction with dual-compartment housing.

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Compact or remote mount design (sensor with transmitter) – continued

					(17)	Protection type for transmitter/sensor
X	X	X	X	1		IP67 (NEMA 4X) ^a /IP67 (NEMA 4X)
	X	X	X	2		IP67 (NEMA 4X) ^a /IP68 ^b
					(18)	Cable fitting
X	X	X	X	1		M20 × 1.5
X	X	X	X	2		1/2" NPT
					(19)	Voltage supply
X	X	X	X	1		AC 100 to 230 V, 50 Hz
X	X	X	X	2		AC/DC 24 V, 50 Hz
					(20)	Signal inputs and outputs
X	X	X		0		None
X	X	X	X	1		HART and 20 mA passive and pulse and contact input/output ^c
X	X	X	X	2		HART and 20 mA active and pulse and contact input/output ^d
X			X	3		HART and 20 mA active and pulse and contact output ^e
X	X	X	X	4		PROFIBUS-PA and contact output
					(21)	Default settings/diagnosis
	X	X	X	0		None/standard diagnostics functions ^f
X	X	X	X	1		Parameters: default settings; standard diagnosis activated
					(22)	Accessories
X	X	X	X	000		None
	X	X	X	001		With preamplifier, installed in sensor housing
					(23)	Plug connector
X		X		002		Fieldbus M12 × 1 ^g
					(24)	Transmitter housing version
X	X	X	X	003		Single-compartment housing ^h
X			X	004		Dual-compartment housing ⁱ
					(25)	Supply frequency^j
X	X	X	X	012		50 Hz
					(26)	Further options
X	X	X		014		With Gore-Tex membrane
					(27)	Number of test points
X	X	X	X	025		3 points
X	X	X	X	026		5 points
					(28)	Language of documentation
X	X	X	X	029		German
X	X	X	X	030		English
X	X	X	X	036		French
X	X	X	X	037		Spanish

^a Protection type for transmitter = IP67 (NEMA 4X) for single and dual-compartment housing.

^b Only in conjunction with external transmitter

^c Available for version Ex-zone 2 or Ex-zone 1.

^d Available for version Ex-zone 2 or without Ex-protection (model 406018/2-1)

^e Available for version Ex-zone 1.

^f To be selected if the transmitter (model 406018/2-0, 406018/2-1) is ordered as a spare part or without sensor.

^g Only available for PROFIBUS-PA.

^h Not available for version Ex-zone 1.

ⁱ Only available for version Ex-zone 1.

^j If the transmitter is ordered without sensor, the supply frequency must be specified.

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Compact or remote mount design (sensor with transmitter) – continued

Order code	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	406015	/			08				
Order example	406015	/	X	X	XXXX	08	X	XX	X
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
					1				
	XX	XX	X	X	1	X	X	X	X
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	(27)
	X	X	X	XXX	XXX	XXX	XXX	XXX	XXX
	(28)								

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Remote mount design (sensor)

		(1)	Type
		406015	JUMO flowTRANS MAG H01 – sensor
		(2)	Design
		2	Remote mount ^{a, b}
		(3)	Explosion protection
		0	Without Ex-protection
		1	With Ex-protection
		(4)	Nominal width (1)
X	X	0003	DN 3
X	X	0004	DN 4
X	X	0006	DN 6
X	X	0008	DN 8
X	X	0010	DN 10
X	X	0015	DN 15
X	X	0020	DN 20
X	X	0025	DN 25
X	X	0032	DN 32
X	X	0040	DN 40
X	X	0050	DN 50
X	X	0065	DN 65
X	X	0080	DN 80
X	X	0100	DN 100
		(5)	Lining material (2)
X	X	08	PFA
		(6)	Electrode version (3)
X	X	1	Standard
X	X	5	Bullet-nose
X	X	9	Others upon request
		(7)	Measuring electrode material (4)
X	X	01	Stainless steel 1.4539 (904)
X	X	02	NiMo C-4 (2.4610) – Hastelloy
X	X	04	Tantalum
X	X	10	Others upon request
		(8)	Grounding accessories (5)
X	X	1	Standard
X	X	2	Grounding electrodes ⇒ see (7) measuring electrode material
		(9)	Process connection^c (6)
X	X	40	Screw connection according to DIN 11851
X	X	52	Welded socket according to DIN 11850
X	X	60	Tri-Clamp according to DIN 32676
X	X	61	Tri-Clamp according to ASME BPE
X	X	70	Wafer
X	X	80	Without adapter

^a If the transmitter model 406018/2-0 or 406018/2-1 is also required for the sensor model 406015/2-0 or 406015/2-1, the order code "Compact or remote mount design (sensor with transmitter)", page 41 should be used to generate the correct order details.

^b If only the transmitter model 406018/2-0 or 406018/2-1 is needed, the order code "Remote mount design (transmitter)", page 48 should be used to generate the correct order details.

^c Available nominal widths of different process connections ⇒ see chapter "Dimensions", page 17.

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Remote mount design (sensor) – continued

		(10)	Process connection material
X	X	03	Stainless steel with EPDM seal
X	X	04	Stainless steel with EPDM seal and mounting ^a
X	X	09	Without process connection, without seal, with mounting ^a
X	X	10	Without process connection, without seal, without mounting ^b
		(11)	Certificates
X	X	1	Measuring pipe with PED approval
X	X	3	Inspection certificate 3.1 according to EN 10204
X	X	4	Pressure test according to AD2000
X	X	5	Material certification 3.1 according to EN 10204 and pressure test according to AD2000
		(12)	Calibration
X	X	1	Standard accuracy ^c
X	X	2	Enhanced accuracy ^d
		(13)	Ambient temperature sensor (10)
X	X	1	Standard sensor design/-20 to +60 °C (-4 to +140 °F) ^e
		(14)	Nameplate
X	X	1	Adhesive label
X	X	2	Stainless steel
X	X	9	Others upon request
		(15)	Signal cable length
X	X	0	None
X	X	1	5 m standard cable
X	X	2	10 m standard cable
X	X	3	20 m standard cable
X	X	4	30 m standard cable
X	X	5	50 m standard cable
X	X	6	80 m standard cable
X	X	7	100 m standard cable
X	X	8	150 m standard cable
X	X	9	Others upon request
		(16)	Ex-zone
X		0	None
	X	2	ATEX/IECEx zone 2/21
		(17)	Protection type for sensor
X	X	1	IP67 (NEMA 4X)
X	X	2	IP68 ^f
		(18)	Cable fitting
X	X	1	M20 × 1.5
X	X	2	1/2" NPT

^a 3A conformity not available.

^b 3A conformity not available. Specify with process connection "Wafer" or with process connection "without adapter".

^c Standard accuracy (0.4 % of the measured value) includes 2 calibration points. If more than 2 calibration points are required, specify 3 or 5 points under "Number of test points".

^d Enhanced accuracy (0.2 % of the measured value) includes 3 calibration points. If more than 3 calibration points are required, specify 5 points under "Number of test points". Available for DN10 (3/8") to 100 (4").

^e Standard sensor design maximum medium temperature: 130 °C (266 °F) with PFA.

^f Only with external transmitter.

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Remote mount design (sensor) – continued

			(19)	Voltage supply
X	X	0		None
			(20)	Signal inputs and outputs
X	X	0		None
			(21)	Default settings/diagnosis
X	X	1		Parameters: default settings; standard diagnosis activated
			(22)	Accessories
X	X	000		None
X	X	001		With preamplifier, installed in sensor housing ^a
			(23)	Supply frequency^b
X	X	012		50 Hz
			(24)	Further options
X		014		With Gore-Tex membrane
			(25)	Number of test points
X	X	025		3 points
X	X	026		5 points
			(26)	Language of documentation
X	X	029		German
X	X	030		English
X	X	036		French
X	X	037		Spanish

^a Preamplifier required for signal cable lengths > 50 m (160 ft).

^b If the transmitter is ordered without sensor, the supply frequency must be specified.

Order code	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	
	406015	/		-		-	08	-	
Order example	406015	/	X	-	X	-	XXXX	-	08
	(9)	(10)	(11)	(12)	(13)	(14)	(15)	(16)	(17)
	XX	-	XX	-	X	-	X	-	XX
	(19)	(20)	(21)	(22)	(23)	(24)	(25)	(26)	
	0	-	0	-	X	/	XXX	-	XXX

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Remote mount design (transmitter)

		(1)	Type
		406018	JUMO flowTRANS MAG 01 – transmitter
		(2)	Design
		2	Remote mount ^{a, b}
		(3)	Explosion protection
		0	Without Ex-protection
		1	With Ex-protection
		(4)	Ambient temperature sensor
X	X	1	Standard sensor design/-20 to +60 °C (-4 to +140 °F)
		(5)	Nameplate
X	X	1	Adhesive label
X	X	2	Stainless steel
X	X	9	Others upon request
		(6)	Signal cable length
X	X	0	None
		(7)	Ex-zone
X		0	None
	X	2	ATEX/IECEX zone 2/21
		(8)	Protection type for transmitter
X	X	1	IP67 (NEMA 4X)
		(9)	Cable fitting
X	X	1	M20 × 1.5
X	X	2	1/2" NPT
		(10)	Voltage supply
X	X	1	AC 100 to 230 V, 50 Hz
X	X	2	AC/DC 24 V, 50 Hz
		(11)	Signal inputs and outputs
X	X	1	HART and 20 mA passive and pulse and contact input/output ^c
X	X	2	HART and 20 mA active and pulse and contact input/output ^d
X	X	4	PROFIBUS-PA and contact output
		(12)	Default settings/diagnosis
X	X	0	None/standard diagnostics functions ^e
X	X	1	Parameters: default settings; standard diagnosis activated
		(13)	Plug connector
X		002	Fieldbus M12 × 1 ^f

^a If the sensor model 406015/2-0 or 406015/2-1 is also required for the transmitter model 406018/2-0 or 406018/2-1, the order code "Compact or remote mount design (sensor with transmitter)", page 41 should be used to generate the correct order details.

^b If only the sensor model 406015/2-0 or 406015/2-1 is needed, the order code "Remote mount design (sensor)", page 45 should be used to generate the correct order details.

^c Available for version Ex-zone 2 or without Ex-protection

^d Available for version Ex-zone 2 or without Ex-protection

^e To be selected if the transmitter (model 406018/2-0, 406018/2-1) is ordered as a spare part or without sensor.

^f Only available for PROFIBUS-PA.

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Remote mount design (transmitter) – continued

			(14)	Transmitter housing version
X	X	000		none
X	X	003		Single-compartment housing
			(15)	Further options
X	X	014		With Gore-Tex membrane
			(16)	Language of documentation
X	X	029		German
X	X	030		English
X	X	036		French
X	X	037		Spanish

Order code (1) 406018 / (2) 2 - (3) X - (4) 1 - (5) X - (6) 0 - (7) X - (8) 1 -
Order example 406018 / 2 - X - 1 - X - 0 - X - 1 -

 (9) (10) (11) (12) (13) (14) (15) (16)
 X - X - X - X / XXX - XXX - XXX - XXX

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Accessories

Available signal cable lengths

Signal cable length ^a	Part no.	Ex-zone 2 or outside of Ex-area	
5 m (16.4 ft)	00648906 (scope of delivery)	406015/2-0	406018/2-0
10 m (32.8 ft)	00648907	406015/2-1	406018/2-1
20 m (65.6 ft)	00648909		
30 m (98.4 ft)	00648910		
50 m (164.0 ft)	00648912		
80 m (262.5 ft)	00648913		
100 m (328 ft)	Upon request		
150 m (492 ft)	Upon request		

^a At a minimum conductivity for the measurement medium of $\geq 5 \mu\text{S/cm}$, a preamplifier is required for cable lengths $> 50 \text{ m}$ (164 ft).



IMPORTANT (NOTE)!

Minimum signal cable length:

In potentially explosive areas with combustible dust, the signal cable must not be shorter than 5 m (16.40 ft).

Cable conduit sealing

Designation	Part no.	
Mounting set for sealing the cable conduit	00649012	
		G01312

Grounding plates

For the process connection "Wafer" and with installation in plastic lines or pipelines with insulated lining, additional grounding via grounding plates is required (1). In this case it is recommended that one grounding plate is fitted in front of the device and one is fitted behind.

Designation	Part no.	
Grounding plate ^a (1)	-	

^a Available upon request for all available process connections in different materials.